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K2 Solo 3G

Production Client

Service Manual

www.grassvalley.com

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November 2012

CERTIFICATE

Certificate Number: 510040.001

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This product may be covered by one or more U.S. and foreign patents.

Grass Valley Web Site

The http://www.grassvalley.com/support web site offers the following:

Online User Documentation — Current versions of product catalogs, brochures, data sheets, ordering guides, planning guides, manuals, and release notes in .pdf format can be downloaded.

FAQ Database — Solutions to problems and troubleshooting efforts can be found by searching our Frequently Asked Questions (FAQ) database.

Software Downloads — Download software updates, drivers, and patches.

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END-OF-LIFE PRODUCT RECYCLING NOTICE

Grass Valley's innovation and excellence in product design also extends to the programs we've established to manage the recycling of our products. Grass Valley has developed a comprehensive end-of-life product take back program for recycle or disposal of end-of-life products. Our program meets the requirements of the European Union's WEEE Directive, the United States Environmental Protection Agency, and U.S. state and local agencies.

Grass Valley's end-of-life product take back program assures proper disposal by use of Best Available Technology. This program accepts any Grass Valley branded equipment. Upon request, a Certificate of Recycling or a Certificate of Destruction, depending on the ultimate disposition of the product, can be sent to the requester.

Grass Valley will be responsible for all costs associated with recycling and disposal, including freight. However, you are responsible for the removal of the equipment from your facility and packing the equipment to make it ready for pickup.

For further information on the Grass Valley product take back system please contact Grass Valley at + 800 80 80 20 20 or +33 1 48 25 20 20 from most other countries. In the U.S. and Canada please call 800-547-8949, and ask to be connected to the EH&S Department. Additional information concerning the program can be found at: www.grassvalley.com/about/environmental-policy

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Preface

About this document

This service manual provides procedures for servicing the K2™ Solo™ 3G Production Client to the field-replaceable unit level. Use this manual to isolate problems to a board or module, such as the Power Supply, and to make repairs through module exchange.

For more information

The following sections help you find the information you need in product manuals and elsewhere.

For the installer of a standalone K2 product with internal storage

If you are installing a K2 system, such as a K2 Summit/Solo system, with standalone internal storage, refer to documentation in the following sequence:

	Find this document…	In these locations…	In these formats:
1	K2 Release Notes	Grass Valley Website	PDF file
2	Quick Start Guide for the K2 product	K2 product shipping box	Printed
		K2 Documentation Set	PDF file
		Grass Valley Website	PDF file
3	K2 System Guide	K2 Documentation Set	PDF file
		Grass Valley Website	PDF file

K2 Release Notes

Contains the latest information about the software shipped on your system, including software upgrade instructions, software specifications and requirements, feature changes from the previous releases, and any known problems. You should always check the Grass Valley Website to determine if there is an updated version of release notes available.

Quick Start Guides

The Quick Start Guide is a printed document, shipped in the product packaging with K2 Summit/Solo systems and K2 Dyno Replay Controllers. The Quick Start Guide provides step-by-step installation instructions for basic installation and operation of the product.

K2 Storage Cabling Guide

The K2 Storage Cabling Guide is a printed document, shipped in the product packaging with the primary RAID storage chassis. The cabling guide provides instructions for K2 Storage Area Network (SAN) cabling and external configuration. The cabling guide provides instructions for each level of K2 SAN and covers both redundant and basic (non-redundant) systems. It also provides instructions for connecting direct-connect external RAID storage to K2 Summit systems.

K2 Documentation Set

Except for the release notes, the full set of support documentation, including this manual, is available in the K2 or K2/STRATUS Documentation Set. You can find the Documentation Set on the Grass Valley website. The following URL allows you to browse by K2 software version:

http://www.grassvalley.com/dl/k2_summit

You can also find the Documentation Set on the USB Recovery Flash drive that ships with your K2 Summit/Solo system.

The Documentation Set includes the following K2 product documents:

K2 AppCenter User Manual	Provides instructions for configuring and operating the media channels of product.
Quick Start Guides	The Quick Start Guide provides step-by-step installation instructions for basic installation and operation of the product.
K2 System Guide	Contains the product specifications and instructions for modifying system settings.
K2 Service Manuals	Contains information on servicing and maintaining the K2 product.
K2 SAN Installation and Service Manual	Contains installation, configuration, and maintenance procedures for shared storage options.
K2 Storage Cabling Guide	The cabling guide provides instructions for K2 Storage Area Network (SAN) cabling and external configuration. The cabling guide provides instructions for each level of K2 SAN and covers both redundant and basic (non-redundant) systems. It also provides instructions for connecting direct-connect external RAID storage to K2 Summit systems.
Fibre Channel Switch Installation Manual	Contains information on configuring and servicing the Fibre Channel switch.

On-line Help Systems

You can find documentation online with products as follows:

K2 AppCenter Help	Contains information on using K2 AppCenter. In the AppCenter user interface menu bar select **Help**, then choose **AppCenter Help Topics** from the drop-down menu.

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SiteConfig Help	Contains information on using SiteConfig. In the SiteConfig user interface menu bar select **Help**, then choose **SiteConfig Help Topics** from the drop-down menu.

K2 FCP Connect documentation

The K2 FCP Connect product has its own documentation set, described as follows:

GV Connect User Manual	Provides instructions for using GV Connect, which is a Final Cut Pro plugin, to access and work with K2 assets. GV Connect is part of the K2 FCP Connect product.
GV Browse User Manual	Provides instructions for using GV Browse, which is a Final Cut Pro plugin, to access and work with assets on a MediaFrame server in an Aurora Browse system. GV Connect is part of the K2 FCP Connect product.
K2 FCP Connect Installation Manual	Provides detailed instructions to install and configure the K2 FCP Connect product.
K2 FCP Connect Release Notes	Contains the latest information about the K2 FCP Connect product, including software upgrade instructions, software specifications and requirements, feature changes from the previous releases, and any known problems. You should always check the Grass Valley Website to determine if there is an updated version of release notes available.

Grass Valley Website

This public Web site contains all the latest manuals and documentation, and additional support information. Use the following URL.

http://www.grassvalley.com

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Safety Summaries

Safety Summary

Read and follow the important safety information below, noting especially those instructions related to risk of fire, electric shock or injury to persons. Additional specific warnings not listed here may be found throughout the manual.

⚠ ***WARNING: Any instructions in this manual that require opening the equipment cover or enclosure are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.***

Safety terms and symbols

Terms in this manual

Safety-related statements may appear in this manual in the following form:

⚠ ***WARNING: Warning statements identify conditions or practices that may result in personal injury or loss of life.***

⚠ ***CAUTION: Caution statements identify conditions or practices that may result in damage to equipment or other property, or which may cause equipment crucial to your business environment to become temporarily non-operational.***

Terms on the product

These terms may appear on the product:

DANGER — A personal injury hazard is immediately accessible as you read the marking.

WARNING — A personal injury hazard exists but is not immediately accessible as you read the marking.

CAUTION — A hazard to property, product, and other equipment is present.

Symbols on the product

The following symbols may appear on the product:

⚠	Indicates that dangerous high voltage is present within the equipment enclosure that may be of sufficient magnitude to constitute a risk of electric shock.
⚠	Indicates that user, operator or service technician should refer to product manual(s) for important operating, maintenance, or service instructions.
⚠	This is a prompt to note fuse rating when replacing fuse(s). The fuse referenced in the text must be replaced with one having the ratings indicated.

⏚	Identifies a protective grounding terminal which must be connected to earth ground prior to making any other equipment connections.
⏚	Identifies an external protective grounding terminal which may be connected to earth ground as a supplement to an internal grounding terminal.
	Indicates that static sensitive components are present which may be damaged by electrostatic discharge. Use anti-static procedures, equipment and surfaces during servicing.

Warnings

The following warning statements identify conditions or practices that can result in personal injury or loss of life.

Dangerous voltage or current may be present — Disconnect power and remove battery (if applicable) before removing protective panels, soldering, or replacing components.

Do not service alone — Do not internally service this product unless another person capable of rendering first aid and resuscitation is present.

Remove jewelry — Prior to servicing, remove jewelry such as rings, watches, and other metallic objects.

Avoid exposed circuitry — Do not touch exposed connections, components or circuitry when power is present.

Use proper power cord — Use only the power cord supplied or specified for this product.

Ground product — Connect the grounding conductor of the power cord to earth ground.

Operate only with covers and enclosure panels in place — Do not operate this product when covers or enclosure panels are removed.

Use correct fuse — Use only the fuse type and rating specified for this product.

Use only in dry environment — Do not operate in wet or damp conditions.

Use only in non-explosive environment — Do not operate this product in an explosive atmosphere.

High leakage current may be present — Earth connection of product is essential before connecting power.

Dual power supplies may be present — Be certain to plug each power supply cord into a separate branch circuit employing a separate service ground. Disconnect both power supply cords prior to servicing.

Double pole neutral fusing — Disconnect mains power prior to servicing.

Use proper lift points — Do not use door latches to lift or move equipment.

Avoid mechanical hazards — Allow all rotating devices to come to a stop before servicing.

Cautions

The following caution statements identify conditions or practices that can result in damage to equipment or other property

Use correct power source — Do not operate this product from a power source that applies more than the voltage specified for the product.

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Use correct voltage setting — If this product lacks auto-ranging power supplies, before applying power ensure that the each power supply is set to match the power source.

Provide proper ventilation — To prevent product overheating, provide equipment ventilation in accordance with installation instructions.

Use anti-static procedures — Static sensitive components are present which may be damaged by electrostatic discharge. Use anti-static procedures, equipment and surfaces during servicing.

Do not operate with suspected equipment failure — If you suspect product damage or equipment failure, have the equipment inspected by qualified service personnel.

Ensure mains disconnect — If mains switch is not provided, the power cord(s) of this equipment provide the means of disconnection. The socket outlet must be installed near the equipment and must be easily accessible. Verify that all mains power is disconnected before installing or removing power supplies and/or options.

Route cable properly — Route power cords and other cables so that they ar not likely to be damaged. Properly support heavy cable bundles to avoid connector damage.

Use correct power supply cords — Power cords for this equipment, if provided, meet all North American electrical codes. Operation of this equipment at voltages exceeding 130 VAC requires power supply cords which comply with NEMA configurations. International power cords, if provided, have the approval of the country of use.

Use correct replacement battery — This product may contain batteries. To reduce the risk of explosion, check polarity and replace only with the same or equivalent type recommended by manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Troubleshoot only to board level — Circuit boards in this product are densely populated with surface mount technology (SMT) components and application specific integrated circuits (ASICS). As a result, circuit board repair at the component level is very difficult in the field, if not impossible. For warranty compliance, do not troubleshoot systems beyond the board level.

Sicherheit – Überblick

Lesen und befolgen Sie die wichtigen Sicherheitsinformationen dieses Abschnitts. Beachten Sie insbesondere die Anweisungen bezüglich

Brand-, Stromschlag- und Verletzungsgefahren. Weitere spezifische, hier nicht aufgeführte Warnungen finden Sie im gesamten Handbuch.

⚠ ***WARNUNG: Alle Anweisungen in diesem Handbuch, die das Abnehmen der Geräteabdeckung oder des Gerätegehäuses erfordern, dürfen nur von qualifiziertem Servicepersonal ausgeführt werden. Um die Stromschlaggefahr zu verringern, führen Sie keine Wartungsarbeiten außer den in den Bedienungsanleitungen genannten Arbeiten aus, es sei denn, Sie besitzen die entsprechende Qualifikationen für diese Arbeiten.***

Sicherheit – Begriffe und Symbole

In diesem Handbuch verwendete Begriffe

Sicherheitsrelevante Hinweise können in diesem Handbuch in der folgenden Form auftauchen:

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⚠	***WARNUNG: Warnungen weisen auf Situationen oder Vorgehensweisen hin, die Verletzungs- oder Lebensgefahr bergen.***
⚠	***VORSICHT: Vorsichtshinweise weisen auf Situationen oder Vorgehensweisen hin, die zu Schäden an Ausrüstungskomponenten oder anderen Gegenständen oder zum zeitweisen Ausfall wichtiger Komponenten in der Arbeitsumgebung führen können.***

Hinweise am Produkt

Die folgenden Hinweise können sich am Produkt befinden:

GEFAHR – Wenn Sie diesen Begriff lesen, besteht ein unmittelbares Verletzungsrisiko.

WARNUNG – Wenn Sie diesen Begriff lesen, besteht ein mittelbares Verletzungsrisiko.

VORSICHT – Es besteht ein Risiko für Objekte in der Umgebung, den Mixer selbst oder andere Ausrüstungskomponenten.

Symbole am Produkt

Die folgenden Symbole können sich am Produkt befinden:

⚠	Weist auf eine gefährliche Hochspannung im Gerätegehäuse hin, die stark genug sein kann, um eine Stromschlaggefahr darzustellen.
⚠	Weist darauf hin, dass der Benutzer, Bediener oder Servicetechniker wichtige Bedienungs-, Wartungs- oder Serviceanweisungen in den Produkthandbüchern lesen sollte.
⚠	Dies ist eine Aufforderung, beim Wechsel von Sicherungen auf deren Nennwert zu achten. Die im Text angegebene Sicherung muss durch eine Sicherung ersetzt werden, die die angegebenen Nennwerte besitzt.
⏚	Weist auf eine Schutzerdungsklemme hin, die mit dem Erdungskontakt verbunden werden muss, bevor weitere Ausrüstungskomponenten angeschlossen werden.
⏚	Weist auf eine externe Schutzerdungsklemme hin, die als Ergänzung zu einem internen Erdungskontakt an die Erde angeschlossen werden kann.
⚠	Weist darauf hin, dass es statisch empfindliche Komponenten gibt, die durch eine elektrostatische Entladung beschädigt werden können. Verwenden Sie antistatische Prozeduren, Ausrüstung und Oberflächen während der Wartung.

Warnungen

Die folgenden Warnungen weisen auf Bedingungen oder Vorgehensweisen hin, die Verletzungs- oder Lebensgefahr bergen:

Gefährliche Spannungen oder Ströme – Schalten Sie den Strom ab, und entfernen Sie ggf. die Batterie, bevor sie Schutzabdeckungen abnehmen, löten oder Komponenten austauschen.

Servicearbeiten nicht alleine ausführen – Führen Sie interne Servicearbeiten nur aus, wenn eine weitere Person anwesend ist, die erste Hilfe leisten und Wiederbelebungsmaßnahmen einleiten kann.

Schmuck abnehmen – Legen Sie vor Servicearbeiten Schmuck wie Ringe, Uhren und andere metallische Objekte ab.

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Keine offen liegenden Leiter berühren – Berühren Sie bei eingeschalteter Stromzufuhr keine offen liegenden Leitungen, Komponenten oder Schaltungen.

Richtiges Netzkabel verwenden – Verwenden Sie nur das mitgelieferte Netzkabel oder ein Netzkabel, das den Spezifikationen für dieses Produkt entspricht.

Gerät erden – Schließen Sie den Erdleiter des Netzkabels an den Erdungskontakt an.

Gerät nur mit angebrachten Abdeckungen und Gehäuseseiten betreiben – Schalten Sie dieses Gerät nicht ein, wenn die Abdeckungen oder Gehäuseseiten entfernt wurden.

Richtige Sicherung verwenden – Verwenden Sie nur Sicherungen, deren Typ und Nennwert den Spezifikationen für dieses Produkt entsprechen.

Gerät nur in trockener Umgebung verwenden – Betreiben Sie das Gerät nicht in nassen oder feuchten Umgebungen.

Gerät nur verwenden, wenn keine Explosionsgefahr besteht – Verwenden Sie dieses Produkt nur in Umgebungen, in denen keinerlei Explosionsgefahr besteht.

Hohe Kriechströme – Das Gerät muss vor dem Einschalten unbedingt geerdet werden.

Doppelte Spannungsversorgung kann vorhanden sein – Schließen Sie die beiden Anschlußkabel an getrennte Stromkreise an. Vor Servicearbeiten sind beide Anschlußkabel vom Netz zu trennen.

Zweipolige, neutrale Sicherung – Schalten Sie den Netzstrom ab, bevor Sie mit den Servicearbeiten beginnen.

Fassen Sie das Gerät beim Transport richtig an – Halten Sie das Gerät beim Transport nicht an Türen oder anderen beweglichen Teilen fest.

Gefahr durch mechanische Teile – Warten Sie, bis der Lüfter vollständig zum Halt gekommen ist, bevor Sie mit den Servicearbeiten beginnen.

Vorsicht

Die folgenden Vorsichtshinweise weisen auf Bedingungen oder Vorgehensweisen hin, die zu Schäden an Ausrüstungskomponenten oder anderen Gegenständen führen können:

Gerät nicht öffnen – Durch das unbefugte Öffnen wird die Garantie ungültig.

Richtige Spannungsquelle verwenden – Betreiben Sie das Gerät nicht an einer Spannungsquelle, die eine höhere Spannung liefert als in den Spezifikationen für dieses Produkt angegeben.

Gerät ausreichend belüften – Um eine Überhitzung des Geräts zu vermeiden, müssen die Ausrüstungskomponenten entsprechend den Installationsanweisungen belüftet werden. Legen Sie kein Papier unter das Gerät. Es könnte die Belüftung behindern. Platzieren Sie das Gerät auf einer ebenen Oberfläche.

Antistatische Vorkehrungen treffen – Es gibt statisch empfindliche Komponenten, die durch eine elektrostatische Entladung beschädigt werden können. Verwenden Sie antistatische Prozeduren, Ausrüstung und Oberflächen während der Wartung.

CF-Karte nicht mit einem PC verwenden – Die CF-Karte ist speziell formatiert. Die auf der CF-Karte gespeicherte Software könnte gelöscht werden.

Gerät nicht bei eventuellem Ausrüstungsfehler betreiben – Wenn Sie einen Produktschaden oder Ausrüstungsfehler vermuten, lassen Sie die Komponente von einem qualifizierten Servicetechniker untersuchen.

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Kabel richtig verlegen – Verlegen Sie Netzkabel und andere Kabel so, dass Sie nicht beschädigt werden. Stützen Sie schwere Kabelbündel ordnungsgemäß ab, damit die Anschlüsse nicht beschädigt werden.

Richtige Netzkabel verwenden – Wenn Netzkabel mitgeliefert wurden, erfüllen diese alle nationalen elektrischen Normen. Der Betrieb dieses Geräts mit Spannungen über 130 V AC erfordert Netzkabel, die NEMA-Konfigurationen entsprechen. Wenn internationale Netzkabel mitgeliefert wurden, sind diese für das Verwendungsland zugelassen.

Richtige Ersatzbatterie verwenden – Dieses Gerät enthält eine Batterie. Um die Explosionsgefahr zu verringern, prüfen Sie die Polarität und tauschen die Batterie nur gegen eine Batterie desselben Typs oder eines gleichwertigen, vom Hersteller empfohlenen Typs aus. Entsorgen Sie gebrauchte Batterien entsprechend den Anweisungen des Batterieherstellers.

Das Gerät enthält keine Teile, die vom Benutzer gewartet werden können. Wenden Sie sich bei Problemen bitte an den nächsten Händler.

Consignes desécurité

Il est recommandé de lire, de bien comprendre et surtout de respecter les informations relatives à la sécurité qui sont exposées ci-après, notamment les consignes destinées à prévenir les risques d'incendie, les décharges électriques et les blessures aux personnes. Les avertissements complémentaires, qui ne sont pas nécessairement repris ci-dessous, mais présents dans toutes les sections du manuel, sont également à prendre en considération.

⚠ ***AVERTISSEMENT: Toutes les instructions présentes dans ce manuel qui concernent l'ouverture des capots ou des logements de cet équipement sont destinées exclusivement à des membres qualifiés du personnel de maintenance. Afin de diminuer les risques de décharges électriques, ne procédez à aucune intervention d'entretien autre que celles contenues dans le manuel de l'utilisateur, à moins que vous ne soyez habilité pour le faire.***

Consignes et symboles de sécurité

Termes utilisés dans ce manuel

Les consignes de sécurité présentées dans ce manuel peuvent apparaître sous les formes suivantes :

⚠ ***AVERTISSEMENT: Les avertissements signalent des conditions ou des pratiques susceptibles d'occasionner des blessures graves, voire même fatales.***

⚠ ***MISE EN GARDE: Les mises en garde signalent des conditions ou des pratiques susceptibles d'occasionner un endommagement à l'équipement ou aux installations, ou de rendre l'équipement temporairement non opérationnel, ce qui peut porter préjudice à vos activités.***

Signalétique apposée sur le produit

La signalétique suivante peut être apposée sur le produit :

DANGER — risque de danger imminent pour l'utilisateur.

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AVERTISSEMENT — Risque de danger non imminent pour l'utilisateur.

MISE EN GARDE — Risque d'endommagement du produit, des installations ou des autres équipements.

Symboles apposés sur le produit

Les symboles suivants peut être apposés sur le produit :

	Signale la présence d'une tension élevée et dangereuse dans le boîtier de l'équipement ; cette tension peut être suffisante pour constituer un risque de décharge électrique.
	Signale que l'utilisateur, l'opérateur ou le technicien de maintenance doit faire référence au(x) manuel(s) pour prendre connaissance des instructions d'utilisation, de maintenance ou d'entretien.
	Il s'agit d'une invite à prendre note du calibre du fusible lors du remplacement de ce dernier. Le fusible auquel il est fait référence dans le texte doit être remplacé par un fusible du même calibre.
	Identifie une borne de protection de mise à la masse qui doit être raccordée correctement avant de procéder au raccordement des autres équipements.
	I dentifie une borne de protection de mise à la masse qui peut être connectée en tant que borne de mise à la masse supplémentaire.
	Signale la présence de composants sensibles à l'électricité statique et qui sont susceptibles d'être endommagés par une décharge électrostatique. Utilisez des procédures, des équipements et des surfaces antistatiques durant les interventions d'entretien.

Avertissements

Les avertissements suivants signalent des conditions ou des pratiques susceptibles d'occasionner des blessures graves, voire même fatales :

Présence possible de tensions ou de courants dangereux — Mettez hors tension, débranchez et retirez la pile (le cas échéant) avant de déposer les couvercles de protection, de défaire une soudure ou de remplacer des composants.

Ne procédez pas seul à une intervention d'entretien — Ne réalisez pas une intervention d'entretien interne sur ce produit si une personne n'est pas présente pour fournir les premiers soins en cas d'accident.

Retirez tous vos bijoux — Avant de procéder à une intervention d'entretien, retirez tous vos bijoux, notamment les bagues, la montre ou tout autre objet métallique.

Évitez tout contact avec les circuits exposés — Évitez tout contact avec les connexions, les composants ou les circuits exposés s'ils sont sous tension.

Utilisez le cordon d'alimentation approprié — Utilisez exclusivement le cordon d'alimentation fourni avec ce produit ou spécifié pour ce produit.

Raccordez le produit à la masse — Raccordez le conducteur de masse du cordon d'alimentation à la borne de masse de la prise secteur.

Utilisez le produit lorsque les couvercles et les capots sont en place — N'utilisez pas ce produit si les couvercles et les capots sont déposés.

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Utilisez le bon fusible — Utilisez exclusivement un fusible du type et du calibre spécifiés pour ce produit.

Utilisez ce produit exclusivement dans un environnement sec — N'utilisez pas ce produit dans un environnement humide.

Utilisez ce produit exclusivement dans un environnement non explosible — N'utilisez pas ce produit dans un environnement dont l'atmosphère est explosible.

Présence possible de courants de fuite — Un raccordement à la masse est indispensable avant la mise sous tension.

Deux alimentations peuvent être présentes dans l'équipement — Assurez vous que chaque cordon d'alimentation est raccordé à des circuits de terre séparés. Débranchez les deux cordons d'alimentation avant toute intervention.

Fusion neutre bipolaire — Débranchez l'alimentation principale avant de procéder à une intervention d'entretien.

Utilisez les points de levage appropriés — Ne pas utiliser les verrous de la porte pour lever ou déplacer l'équipement.

Évitez les dangers mécaniques — Laissez le ventilateur s'arrêter avant de procéder à une intervention d'entretien.

Mises en garde

Les mises en garde suivantes signalent les conditions et les pratiques susceptibles d'occasionner des endommagements à l'équipement et aux installations :

N'ouvrez pas l'appareil — Toute ouverture prohibée de l'appareil aura pour effet d'annuler la garantie.

Utilisez la source d'alimentation adéquate — Ne branchez pas ce produit à une source d'alimentation qui utilise une tension supérieure à la tension nominale spécifiée pour ce produit.

Assurez une ventilation adéquate — Pour éviter toute surchauffe du produit, assurez une ventilation de l'équipement conformément aux instructions d'installation. Ne déposez aucun document sous l'appareil – ils peuvent gêner la ventilation. Placez l'appareil sur une surface plane.

Utilisez des procédures antistatiques - Les composants sensibles à l'électricité statique présents dans l'équipement sont susceptibles d'être endommagés par une décharge électrostatique. Utilisez des procédures, des équipements et des surfaces antistatiques durant les interventions d'entretien.

N'utilisez pas la carte CF avec un PC — La carte CF a été spécialement formatée. Le logiciel enregistré sur la carte CF risque d'être effacé.

N'utilisez pas l'équipement si un dysfonctionnement est suspecté — Si vous suspectez un dysfonctionnement du produit, faites inspecter celui-ci par un membre qualifié du personnel d'entretien.

Acheminez les câbles correctement — Acheminez les câbles d'alimentation et les autres câbles de manière à ce qu'ils ne risquent pas d'être endommagés. Supportez correctement les enroulements de câbles afin de ne pas endommager les connecteurs.

Utilisez les cordons d'alimentation adéquats — Les cordons d'alimentation de cet équipement, s'ils sont fournis, satisfont aux exigences de toutes les réglementations régionales. L'utilisation de cet équipement à des tensions dépassant les 130 V en c.a. requiert des cordons d'alimentation qui satisfont aux exigences des configurations NEMA. Les cordons internationaux, s'ils sont fournis, ont reçu l'approbation du pays dans lequel l'équipement est utilisé.

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Utilisez une pile de remplacement adéquate — Ce produit renferme une pile. Pour réduire le risque d'explosion, vérifiez la polarité et ne remplacez la pile que par une pile du même type, recommandée par le fabricant. Mettez les piles usagées au rebut conformément aux instructions du fabricant des piles.

Cette unité ne contient aucune partie qui peut faire l'objet d'un entretien par l'utilisateur. Si un problème survient, veuillez contacter votre distributeur local.

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Certifications and compliances

Canadian certified power cords

Canadian approval includes the products and power cords appropriate for use in the North America power network. All other power cords supplied are approved for the country of use.

FCC emission control

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Changes or modifications not expressly approved by Grass Valley can affect emission compliance and could void the user's authority to operate this equipment.

Canadian EMC Notice of Compliance

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A préscrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

EN55103 1/2 Class A warning

This product has been evaluated for Electromagnetic Compatibility under the EN 55103-1/2 standards for Emissions and Immunity and meets the requirements for E4 environment.

This product complies with Class A (E4 environment). In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

FCC emission limits

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesirable operation.

Laser compliance

Laser safety requirements

This product may contain a Class 1 certified laser device. Operating this product outside specifications or altering its original design may result in hazardous radiation exposure, and may be considered an act of modifying or new manufacturing of a laser product under U.S. regulations contained in 21CFR Chapter 1, subchapter J or CENELEC regulations in HD 482 S1. People performing such an act are required by law to recertify and reidentify this product in accordance with provisions of 21CFR subchapter J for distribution within the U.S.A., and in accordance with CENELEC HD 482 S1 for distribution within countries using the IEC 825 standard.

Laser safety

Laser safety in the United States is regulated by the Center for Devices and Radiological Health (CDRH). The laser safety regulations are published in the "Laser Product Performance Standard," Code of Federal Regulation (CFR), Title 21, Subchapter J.

The International Electrotechnical Commission (IEC) Standard 825, "Radiation of Laser Products, Equipment Classification, Requirements and User's Guide," governs laser products outside the United States. Europe and member nations of the European Free Trade Association fall under the jurisdiction of the Comité Européen de Normalization Electrotechnique (CENELEC).

Safety certification

This product has been evaluated and meets the following Safety Certification Standards:

Standard	Designed/tested for compliance with:
ANSI/UL 60950-1	Safety of Information Technology Equipment, including Electrical Business Equipment (Second edition 2007).
IEC 60950-1 with CB cert.	Safety of Information Technology Equipment, including Electrical Business Equipment (Second edition, 2005).
CAN/CSA C22.2 No. 60950-1	Safety of Information Technology Equipment, including Electrical Business Equipment (Second edition 2007).
BS EN 60950-1	Safety of Information Technology Equipment, including Electrical Business Equipment 2006.

ESD Protection

Electronics today are more susceptible to electrostatic discharge (ESD) damage than older equipment. Damage to equipment can occur by ESD fields that are smaller than you can feel. Implementing the information in this section will help you protect the investment that you have made in purchasing Grass Valley equipment. This section contains Grass Valley's recommended ESD guidelines that should be followed when handling electrostatic discharge sensitive (ESDS) items. These minimal recommendations are based on the information in the *Sources of ESD and Risks* on page 23 area. The information in *Grounding Requirements for Personnel* on page 24 is provided to assist you in selecting an appropriate grounding method.

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Recommended ESD Guidelines

Follow these guidelines when handling Grass Valley equipment:

- Only trained personnel that are connected to a grounding system should handle ESDS items.
- Do not open any protective bag, box, or special shipping packaging until you have been grounded.

  NOTE: When a Personal Grounding strap is unavailable, as an absolute minimum, touch a metal object that is touching the floor (for example, a table, frame, or rack) to discharge any static energy before touching an ESDS item.
- Open the anti-static packaging by slitting any existing adhesive tapes. Do not tear the tapes off.
- Remove the ESDS item by holding it by its edges or by a metal panel.
- Do not touch the components of an ESDS item unless it is absolutely necessary to configure or repair the item.
- Keep the ESDS work area clear of all nonessential items such as coffee cups, pens, wrappers and personal items as these items can discharge static. If you need to set an ESDS item down, place it on an anti-static mat or on the anti-static packaging.

Sources of ESD and Risks

The following information identifies possible sources of electrostatic discharge and can be used to help establish an ESD policy.

Personnel

One of the largest sources of static is personnel. The static can be released from a person's clothing and shoes.

Environment

The environment includes the humidity and floors in a work area. The humidity level must be controlled and should not be allowed to fluctuate over a broad range. Relative humidity (RH) is a major part in determining the level of static that is being generated. For example, at 10% - 20% RH a person walking across a carpeted floor can develop 35kV; yet when the relative humidity is increased to 70% - 80%, the person can only generate 1.5kV.

Static is generated as personnel move (or as equipment is moved) across a floor's surface. Carpeted and waxed vinyl floors contribute to static build up.

Work Surfaces

Painted or vinyl-covered tables, chairs, conveyor belts, racks, carts, anodized surfaces, plexiglass covers, and shelving are all static generators.

Equipment

Any equipment commonly found in an ESD work area, such as solder guns, heat guns, blowers, etc., should be grounded.

Materials

Plastic work holders, foam, plastic tote boxes, pens, packaging containers and other items commonly found at workstations can generate static electricity.

Grounding Requirements for Personnel

The information in this section is provided to assist you in selecting a grounding method. This information is taken from ANSI/ESD S20.20-2007 (Revision of ANSI/ESD S20.20-1999).

Product Qualification

Personnel Grounding Technical Requirement	Test Method	Required Limits
Wrist Strap System*	ANSI/ESD S1.1 (Section 5.11)	$< 3.5 \times 10^7$ ohm
Flooring / Footwear System – Method 1	ANSI/ESD STM97.1	$< 3.5 \times 10^7$ ohm
Flooring / Footwear System – Method 2 (both required)	ANSI/ESD STM97. 1ANSI/ESD STM97.2	$< 10^9$ ohm
	ANSI/ESD STM97.2	< 100 V

Product qualification is normally conducted during the initial selection of ESD control products and materials. Any of the following methods can be used: product specification review, independent laboratory evaluation, or internal laboratory evaluation.

Compliance Verification

Personnel Grounding Technical Requirement	Test Method	Required Limits
Wrist Strap System*	ESD TR53 Wrist Strap Section	$< 3.5 \times 10^7$ ohm
Flooring / Footwear System – Method 1	ESD TR53 Flooring Section and ESD TR53 Footwear Section	$< 3.5 \times 10^7$ ohm
Flooring / Footwear System – Method 2 (both required)	ESD TR53 Flooring Section and ESD TR53 Footwear Section	$< 1.0 \times 10^9$ ohm

* For situations where an ESD garment is used as part of the wrist strap grounding path, the total system resistance, including the person, garment, and grounding cord, must be less than 3.5×10^7 ohm.

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Chapter 1

Product description

This section contains the following topics:

- *Overview description*
- *K2 Solo 3G system orientation*
- *FRU functional descriptions*
- *System Overview*
- *Status indicators*

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Overview description

The K2™ Solo™ 3G system is a cost-effective media platform that incorporates IT and storage technologies. It delivers a networked solution to facilities for replay in sports, news, live, and live-to-tape applications, as well as ingest, playout, and media asset management. It is a comprehensive platform that provides a suite of user applications, system tools, and the largest range of third party interactivity in the industry.

Refer to the "K2 System Guide" for other high-level descriptions of features, controls, applications, and subsystems.

K2 Solo 3G system features

The following features apply to the K2 Solo 3G Media Server:

- Windows 7 64-bit embedded operating system
- Embedded Security for protection against viruses and other unauthorized programs.
- Bidirectional channels (channel can be either an input channel or it can be an output channel)
- Two channels per chassis
- SDI video inputs and outputs
- AES/EBU or embedded audio inputs and outputs.
- Standard Definition (SD) video formats and High Definition (HD) video formats
- AVCHD and H.264 play output (decode) as an option.
- 3G codec module. Codec option card not supported on K2 Solo 3G system.
- Mixed format playback of SD or HD clips on the same timeline
- Up/down/cross HD/SD conversion (e.g. SD and HD clips ingested, then played back as SD or HD clips) or as a different SD or HD format (e.g. 720p to 1080i). Aspect ratios are adjusted.
- VGA monitoring capability
- Compact Flash System drive
- Type III CPU carrier module with 8 GB RAM
- USB 3.0 interface for file exchange
- Ability to create nested bins, i.e. sub-bins within bins
- Freeze mode can be frame or field
- Various video mix effects (e.g. dissolves between two video and audio tracks on the same channel, or fade thru matte color)
- Remote operation and configuration via AppCenter
- Gigabit Ethernet
- AMP, VDCP, and BVW remote control protocols supported
- Remote control over RS-422 or Ethernet
- ExpressCard
- Super Slo-Mo, Multi-cam, and 3D/Video + Key features are available as part of the ChannelFlex Suite.
- Low-resolution proxy files created during record and live streaming from SDI In/out are available as part of the AppCenter Pro and Elite licenses. This requires the Type II carrier module.
- RAID 0 internal media storage

- Support for Dyno S.

K2 Summit/Solo formats, models, licenses, and hardware support

Formats are supported as in the following tables.

Table 1: First-generation K2 Summit/Solo system

Formats	Compression	1x	Multi-Cam, 3D/Video + Key	Super Slo-Mo
SD	DV	Encode/decode	Encode/decode	Not supported.
	MPEG-2	Decode is standard. Encode requires codec option card.	Not supported.	Not supported.
	AVCHD	Not supported.	Not supported.	Not supported.
1080i/720p	DV	Encode/decode. Requires HD license.	Encode/decode. Requires HD license.	Encode/decode. Requires HD license.
	MPEG-2	Decode is standard. Encode requires codec option card. Requires HD license.	Not supported.	Not supported.
	AVC-Intra	Encode/decode. Requires coded option card. Requires HD license.	Encode/decode. Requires coded option card. Requires HD license.	Not supported.
	AVCHD	Not supported	Not supported	Not supported

Table 2: K2 Summit 3G system

Formats	Compression	1x	Multi-Cam, 3D/Video + Key	Super Slo-Mo
SD	DV	Encode/decode	Encode/decode	Not supported.
	MPEG-2	Encode/decode	Encode/decode. Requires codec option card.	Not supported.
	AVCHD/H.264	Decode only. Requires AVC license.	Not supported	Not supported
1080i/720p	DV	Encode/decode. HD license is standard.	Encode/decode. HD license is standard.	Encode/decode. HD license is standard.

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Formats	Compression	1x	Multi-Cam, 3D/Video + Key	Super Slo-Mo
	MPEG-2	Encode/decode. HD license is standard.	Encode/decode. Requires codec option card. HD license is standard.	Not supported.
	AVC-Intra	Encode/decode. Requires AVC license. HD license is standard.	Encode/decode. Requires AVC license. HD license is standard.	Encode/decode. Requires AVC license. HD license is standard.
	AVCHD/H.264	Decode only. Requires AVC license.	Not supported	Not supported

Table 3: K2 Solo 3G system

Formats	Compression	1x	Multi-Cam, 3D/Video + Key	Super Slo-Mo
SD	DV	Encode/decode	Encode/decode	Not supported.
	MPEG-2	Encode/decode	Not supported	Not supported
	AVCHD/H.264	Decode only. Requires AVC license.	Not supported	Not supported
1080i/720p	DV	Encode/decode. HD license is standard.	Encode/decode. HD license is standard.	Encode/decode. HD license is standard.
	MPEG-2	Encode/decode. HD license is standard.	Not supported	Not supported
	AVC-Intra	Encode/decode. Requires AVC license. HD license is standard.	Encode/decode. Requires AVC license. HD license is standard.	Encode/decode. Requires AVC license. HD license is standard.
	AVCHD/H.264	Decode only. Requires AVC license.	Not supported	Not supported

Product identification K2 Solo

K2 Solo 3G system have labels affixed to the chassis that provide product identification as illustrated:

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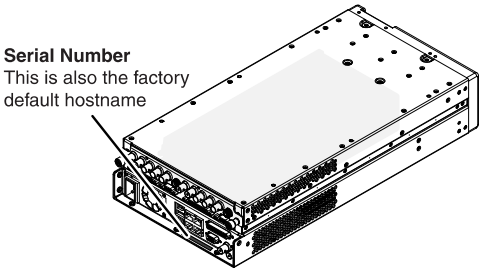
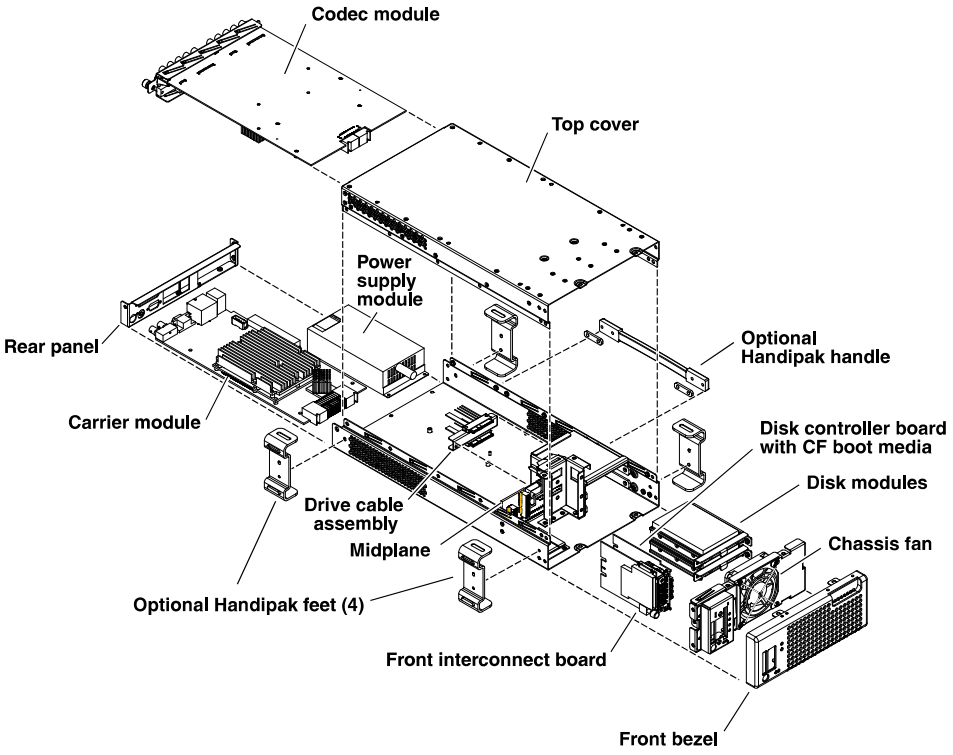


K2 Solo 3G system orientation

The following illustration shows the location of Field Replaceable Units (FRUs) and other components in the K2 Solo 3G system.



FRU functional descriptions

K2 Solo 3G system Field Replaceable Units (FRUs) are described in this section.

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Chassis fan

The chassis fan is mounted in the fan bracket. It provides cooling to the unit. It is mounted in the front of the unit, behind the front bezel.

Related Topics

Fan assembly removal on page 91

Disk modules

There are slots for disk modules in the K2 Solo 3G system. The slots are located behind the front bezel assembly in the front of the chassis. Each slot can contain one disk module, and each module contains one hard drive. A K2 Solo 3G system contains 2 disk modules. Disk modules plug into the drive cable assembly.

Data is written or "striped" across the disks in a continuous fashion, which makes the disks a "stripe group". This stripe group appears as the V: drive to the Windows operating system. The V: drive stores media. It also stores media file system, database, and configuration information.

Disks are configured as RAID 0, so you can not remove and replace a disk module while the K2 Solo Media Server is operational. If a disk fails, you lose all media.

Related Topics

Disk controller board removal on page 93

CompactFlash boot media

The CompactFlash boot media contains the system drive, also known as the C: drive. The C: drive contains application and operating system files. The CompactFlash media is hosted by the front interconnect board.

Related Topics

CompactFlash boot media removal K2 Solo on page 91

Power supply module

The K2 Solo 3G system has one power supply. You can not remove and replace the power supply while the K2 Solo 3G system is operational. The power supply has a fan with automatic speed control. The power supply has protection for over voltage, over current, and short circuits.

Related Topics

Power supply removal on page 99

Codec module

The K2 Solo 3G Media Server has one codec module. The codec module hosts two media input/output channels. The codec module is oriented horizontally across the rear of the K2 Solo 3G Media Server

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chassis. It provides the majority of the K2 Solo 3G Media Server's media-related input and output connectors on the rear panel. The codec module plugs into the midplane board.

The K2 Solo 3G Media Server does not support a codec option card on the codec module.

Related Topics

Unfasten and disconnect cables on page 97

Disk controller board

The disk controller board provides the RAID functionality for the internal disks and reports the status of the chassis fans. It controls status LEDs and the front bezel Power and Service LEDs. It hosts the CompactFlash boot media. It is mounted in the front of the unit and plugs into the midplane board.

Related Topics

Disk controller board removal on page 93

Front interconnect board

The front interconnect board provides front interface functionality. It hosts the front USB ports, the Express Card, and the standby switch. It is mounted in the front of the unit and plugs into the midplane board.

Related Topics

Front interconnect board removal on page 93

Midplane board

The midplane board provides connections for the rear modules. The disk controller board and the front interconnect board also plug into the midplane board. It is mounted in the center of the unit.

Related Topics

Midplane board removal on page 101

Carrier module

The carrier module provides the functionality typically associated with a motherboard in a PC. It hosts the CPU, one optional PCIe board, and provides rear panel connections for Gigabit Ethernet, USB, VGA, and IEEE 1394a (Firewire). The IEEE 1394a port is for debugging purposes only. It is not supported for customer use. Do not attempt to configure or otherwise use this port. The carrier module also provides a GPI connection and connections for reference.

Related Topics

Carrier module removal on page 99

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Drive cable assembly

The drive cable assembly includes the disk cables and a bracket for mounting drive connectors in the chassis.

Related Topics

Drive cable assembly removal on page 101

System Overview

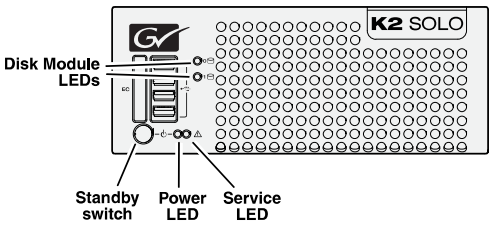
The K2 Solo 3G system is a PCIe bus-based Windows computer with extensive enhancements to provide the video disk recorder functionality. This section explains the major architectural blocks.

Status indicators

The following sections describe the visual and audible indicators that communicate the current operating status and system health of the K2 Solo 3G system.

Front panel indicators

The following indicators are visible from the front panel view.



Power LED

The Power LED indicates status as follows::

LED behavior	Status Condition
Off	The standby switch is set to Off and the K2 Solo 3G system is not operational.
Green steady on	The standby switch is set to On and the K2 Solo 3G system is either in the startup process or has completed the startup process and is operational.

⚠ ***WARNING: The power standby switch does not turn off power to the system. To turn power off both power supplies must be disconnected from the power source.***

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Service LED

The following table explains the status conditions indicated by the different Service LED behaviors. If two or more status conditions occur simultaneously, the LED displays the behavior for the highest priority condition.

LED behavior	Status Condition	Priority
Flashing pattern alternating Yellow/Green/Red/Off twice a second	Identify — The K2 Solo 3G system is being directed to identify itself by NetCentral or some other application.	1
Solid Red	Global failure — The K2 Solo 3G system software has detected a critical error or failure that impacts record/play operations.	2
Solid Yellow	Warning — The K2 Solo 3G system software has detected a problem that requires attention but does not immediately impact record/play operations. For example, a fan or power supply has failed but its redundant partner is maintaining functionality.	3
Flashing Yellow pattern three times a second.	Drive failure — An internal RAID drive has failed. If RAID 1, the failure does not immediately impact record/play operations. The redundant partner RAID drive is maintaining functionality.	4
Flashing pattern alternating Yellow/Green once a second.	Drive rebuild — If RAID 1, an internal RAID drive is rebuilding.	5
Off	Normal — The K2 Solo 3G system is healthy and operating normally.	5

Disk module LEDs

Each disk module has an LED that indicates status. The LEDs are located on the front bezel. The following table explains the status conditions indicated by the different LED behaviors. If two or more status conditions occur simultaneously, the LED displays the behavior for the highest priority condition. Priority number 1 is the highest priority.

LED behavior	Status Condition	Priority
Amber flashing pattern	Identify — The drive is being directed to identify itself by Storage Utility or some other application.	1
Green flashing pattern twice a second.	Rebuild — The RAID controller has marked the drive as rebuilding.	3
Red ON solid	Fault — The RAID controller has marked the drive as faulty.	3
Amber ON solid	Offline — The drive is unbound.	3
Green flashing pattern ten times a second.	Normal drive activity — The drive is healthy and disk access is underway.	3

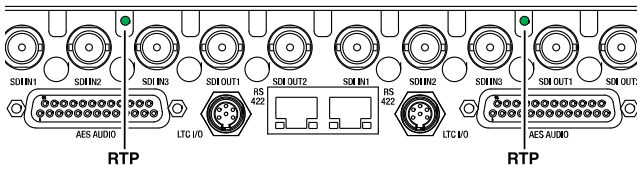
LED behavior	Status Condition	Priority
Green ON solid	Normal drive activity — The drive is healthy and no disk access is currently underway.	3
Off	No drive — Drive is not present or is not fully engaged in slot.	—

Rear panel indicators

The following indicators are visible from the rear panel view.

Codec board indicator

Each channel has a green/red LED that indicates the status of the Real Time Processor (RTP).



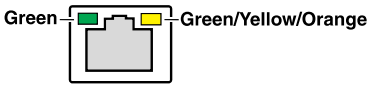
Codec board indicator codes

Interpret the RTP LED as follows:

LED behavior	Status condition
Green flashing at approximately 1 second intervals	RTP is up and connected to the host
Green flashing at greater than 1 second intervals	RTP is not connected to the host.
Red	RTP error condition. Real Time OS is not running.
Off	Real Time OS is not running.

LAN connector indicator codes

The motherboard has four RJ-45 LAN connectors that include integrated status LEDs. The LEDs are oriented as follows:



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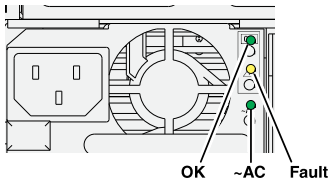
The meanings of the LED states are described in the following table:

LED	LED state	Status Condition
Green	Green On	The adapter is connected to a valid link partner
	Green flashing	Data activity
	Off	No link
Green/Yellow/Orange	Off	10 Mbps
	Green	100 Mbps
	Yellow	10000 Mbps
	Orange flashing	Identify

If a LAN connector is faulty, you must replace the carrier module.

Power supply indicators

Each power supply has LEDs that indicates status.



Interpret the power supply LEDs as follows:

LED	LED state	Status Condition
OK	Green On	The power supply is operating normally.
Fault	Yellow On	There is a power supply fault.
~AC	Green On	The electrical current available to the power supply meets power supply requirements. Input > 85 VAC.

Another indicator of power supply operation is the audible fan noise. If a power cable is connected to either power supply, the fan should stay on continuously on both power supplies. This is the case even if the K2 Solo 3G system is shut down or restarting via the standby switch or the Windows operating system.

The Service LED on the front of the K2 Solo 3G system also indicates power supply status.

If the power source and the power cord are OK yet there is still a power supply problem, the status lights on the power supply indicate the problem.

Related Topics

Service LED on page 33
Power supply problems on page 77

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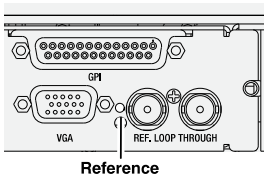
Reference indicator

There is a small hole in the carrier module next to the “REF. LOOP THROUGH” BNC connectors.



Through this hole a LED is visible. When the LED is lit, the reference signal is present and locked.

System beep codes

When you start up the K2 Solo 3G system by pressing the standby switch or by doing a Windows operating system restart, the CPU module might emit two short beeps. Otherwise, if there are no errors present, the K2 Solo 3G system does not emit any audible beeps.

When an error occurs during Power On Self Test (POST), the BIOS displays a POST code that describes the problem. The BIOS might also issue one or more beeps to signal the problem. This indicates a serious error and it is likely that the carrier module must be replaced. Contact Grass Valley Support.

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Chapter 2

System Messages

This section contains the following topics:

- *About system messages*
- *Critical system startup messages*
- *AppCenter startup errors*
- *Viewing AppCenter system status messages*
- *Exporting log files*

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About system messages

The following messages are displayed to indicate system status:

- Normal BIOS messages — These messages can be observed on a locally connected VGA monitor during normal startup processes.
- BIOS POST error messages — If there is a problem these messages are displayed on a locally connected VGA monitor. During the Power On Self Test (POST), the BIOS checks for problems and displays these messages.
- AppCenter startup messages — As AppCenter opens the system determines if health is adequate by checking critical subsystems. A dialog box is displayed that indicates progress and displays messages.
- Status bar and StatusPane messages — During normal operation AppCenter displays system status messages on the status bar. From the status bar you can open the StatusPane to see both current and previous messages. You can observe these messages in AppCenter on a locally connected VGA monitor or on a network connected control point PC.
- Storage Utility messages — While you are using Storage Utility, pop-up message boxes inform you of the current status of the storage system.

Related Topics

Viewing AppCenter system status messages on page 39
Critical system startup messages on page 38

Critical system startup messages

The following messages appear in the AppCenter system startup message box as critical subsystems are checked during startup processes. If a critical failure is detected, the K2 Solo 3G system is rendered inoperable and the failure message appears.

Critical subsystem check messages	Failure messages
System Startup	Startup error
	Missing or bad hardware
	A real time processor is not functioning correctly
Checking hardware…	Hardware fault
Checking media disks…	One or more media disks failed to initialize
	Missing or bad hardware
	Missing or bad database
Checking file system…	No file system is running
Checking database…	Database fault
Checking real-time system status…	A real-time system failed to initialize
Updating configuration…	Failed to synchronize configurations
Starting services…	Unable to communicate with <service name>

AppCenter startup errors

If you start AppCenter and the K2 Solo 3G system is not running, or your login information is not correct, you will see a Startup Error message.

The following table describes the two most common startup error messages.

Startup Error	Description
Log on failed	Your user name or password is not valid for this K2 Solo 3G system. Remember that the password is case sensitive. • Click **Ignore** to view the AppCenter channels. If working remotely, you will see the channels from the last-used channel suite. Or, • Click **Retry** to enter the login information again. Or, • Click Abort. If you are accessing AppCenter through a network-connected Control Point PC, **Abort** lets you try to create a new channel suite. If you are accessing AppCenter locally, it lets you exit to Windows. For assistance with your user name or password, consult your Windows administrator.
<K2 system>:<error>	The K2 Solo 3G system might be offline or have had difficulty with the start up checks. There are various reasons why AppCenter is having difficulty connecting to the K2 Solo 3G system; for example, the error might say there is no file system or that the K2 Solo 3G system has been taken offline for maintenance. • Verify that the host name or IP address is correct and see if you can correct the problem. • If working locally, reboot the K2 Solo 3G system. If working from a network-connected Control Point PC, select **System | Reconnect** from the AppCenter **System** menu.

Viewing AppCenter system status messages

System status messages are displayed in the AppCenter status bar. There are two types of system status messages, as follows:

- Channel status messages — In normal operation, this type of message displays the current operating status of the selected channel.
- System error messages — If a problem develops with the system software or a hardware subsystem, this type of message is displayed for approximately 5 seconds. Afterward, the display returns to the channel status message and the error message is written to the status log file. When a message is written to the status log, a *Status Icon* indicates the severity of the message.

Related Topics

Troubleshooting problems on page 71

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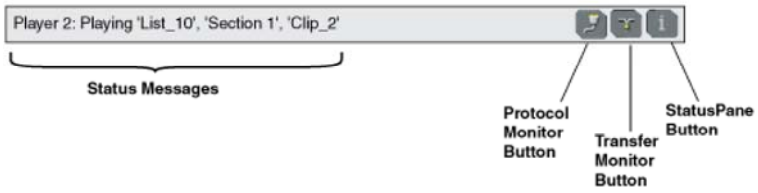
Status bar

System status messages appear in the AppCenter status bar, which is located across the bottom of the AppCenter window, and consists of a message area, several tool buttons, and a status icon. The button icons appear only when the related function is active. In the position of the StatusPane button, status icons appear.



The status bar displays information about the state of the delegated channel as well as low-level error messages. (High priority error messages are displayed in pop-up windows.)

If you select a channel, a status message appears on the left-hand side of the status bar. If a potential error arises while an application is running in a channel, a status message flashes briefly on the left-hand side of the status bar, and an icon displays on the right-hand side. Double click on the icon to open the status pane to view a more detailed message about the channel's status.

The status icon changes depending on the status of the current status message.

Icon	Name	Description
	Information	A recent information message is present.
	Warning	There is at least one warning message, and no alert messages.
	Alert	There is at least one uncleared alert message.

Status pane

Current and previous system status messages can be viewed in the StatusPane. The system status pane also displays general information such as the video and audio settings on the channels. To open the StatusPane, click **Help | System Status**.

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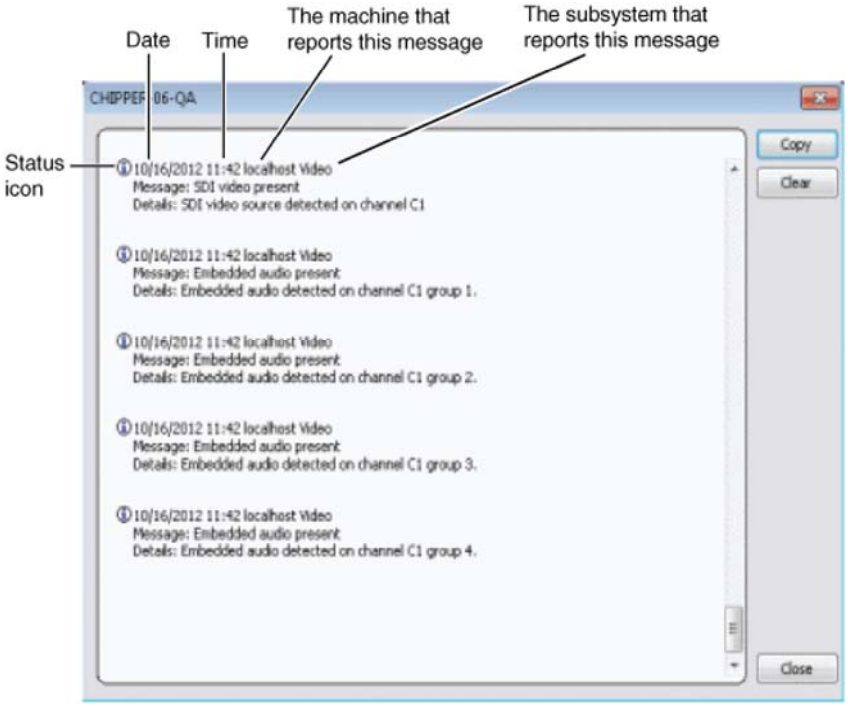
Date
Time
The machine that reports this message
The subsystem that reports this message
Status icon
Copy
Clear
Close
10/16/2012 11:42 localhost Video
Message: SDI video present
Details: SDI video source detected on channel C1
10/16/2012 11:42 localhost Video
Message: Embedded audio present
Details: Embedded audio detected on channel C1 group 1.
10/16/2012 11:42 localhost Video
Message: Embedded audio present
Details: Embedded audio detected on channel C1 group 2.
10/16/2012 11:42 localhost Video
Message: Embedded audio present
Details: Embedded audio detected on channel C1 group 3.
10/16/2012 11:42 localhost Video
Message: Embedded audio present
Details: Embedded audio detected on channel C1 group 4.

The StatusPane is used to view detailed system messages including status, warning, and error messages. System status messages provide status icons and a description of the status event reported by the message. If there is a problem, a corrective action is indicated. Use these messages along with troubleshooting problems to determine if a service procedure is necessary.

If you have a remote AppCenter Channel Suite with channels from multiple K2 systems, the messages from the different machines are combined in the StatusPane that you view from the Channel Suite. To help you determine which machine is generating a message, each message lists the machine name.

NOTE: If the Clear button is grayed out, you do not have the necessary privileges to perform this action, based on the type of user account with which you are currently logged on.

Copying StatusPane messages to the clip board

1. Select the message or messages in the StatusPane.
2. Click **Copy**.

After copying the message, it can be pasted using standard Windows techniques.

Clearing messages

Clearing messages from the StatusPane removes them from the logging database and the StatusPane. This also clears the state of the subsystem indicators so they no longer display the alert and warning symbols.

1. Open the StatusPane, then click **Clear**.

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2. When a message prompts you to confirm, click **Yes**.

All messages are removed from the StatusPane and logging database.

Exporting log files

This topic describes how to export log files from the K2 Solo 3G system. The log files include the following:

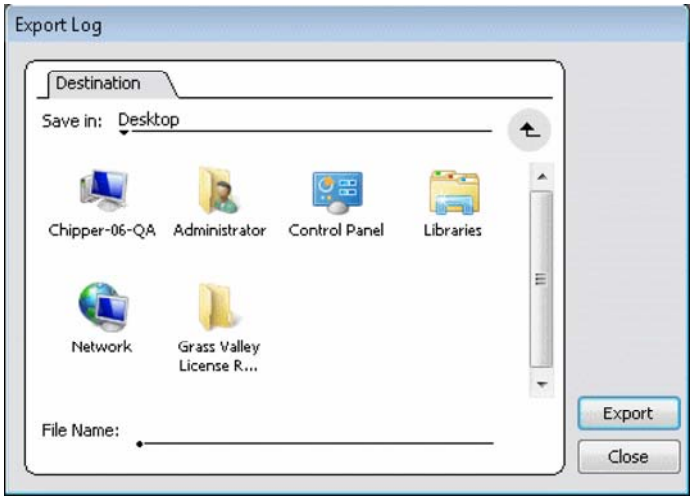
- All application and media database messages
- Version information
- Configuration file, from Configuration Manger

The exported files are combined in a ZIP file. The ZIP file can be sent to Grass Valley product support where they can analyze the logs to determine the operational status of your system.

NOTE: ExportLog does not export StatusPane messages. To capture StatusPane messages, you can copy StatusPane messages to the clip board.

1. Log in as Administrator.
2. Do one of the following to open the Export Log dialog box.
   - In AppCenter click **System | Export Log**.
   - From the Windows desktop, click **Start | All Programs | Grass Valley| Export logs**.
   - From the Windows desktop, click **Start | Run**, type `c:\profile\exportlog` in the Run dialog box, then click **OK**.

   The Export Log dialog box opens.



3. Browse to `C:\Logs` to save the log file.
4. Name the log file.
5. Click **Export**. A progress bar appears.
6. When the export process is complete, and message confirms success. Click **OK** and close the Export Log dialog box to continue.

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7. Find the log file at the specified location.

Related Topics

Copying StatusPane messages to the clip board on page 41

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Chapter 3

Service procedures

This section contains the following topics:

- *Embedded Security modes and policies*
- *Manage Embedded Security Update mode*
- *Replacing a RAID 0 drive*
- *About networking*
- *Restoring network configuration*
- *Checking services*
- *Checking pre-installed software*
- *Making CMOS settings*
- *Restoring disk controller configuration*
- *Recovering the media database*
- *Using recovery images*
- *Using diagnostic tools*

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Embedded Security modes and policies

The Embedded Security solution protects against viruses and other unauthorized programs on the following Grass Valley systems:

- K2 Summit/Solo system
- K2 Media Server
- GV STRATUS server
- K2 Dyno S Replay Controller

Embedded Security prevents any unauthorized programs from running on the system. It contains a whitelist of programs that are authorized to run. Whenever a program attempts to run, it is checked against the whitelist. If the program is not on the whitelist, Embedded Security blocks the program from running. SiteConfig, and any software deployed by SiteConfig, is on the whitelist, so you do not need to manage Embedded Security in any way when using SiteConfig to deploy software. All versions of SiteConfig are compatible with Embedded Security.

When installing software manually (without SiteConfig) it might be necessary to manage Embedded Security. When necessary, you can put Embedded Security in Update mode. This mode allows you to manually install software that is not on the whitelist. Do not confuse Update mode with the idea that Embedded Security is "disabled". When in Update mode, Embedded Security is still active. While in Update mode, Embedded Security keeps track of any software you run or install and adds it to the whitelist. When you are done installing software and any required restarts, you must take Embedded Security out of Update mode so that it can protect the system. For software that requires a restart after installation, such as K2 system software and SNFS media file system software, Embedded Security must remain in Update mode until after the restart is complete.

No system restarts are required for entering or leaving Update mode, and a restart does not change the Update mode status. If in Update mode before a restart, the system remains in Update mode after a restart. You use the Embedded Security Manager to enter and leave Update mode.

The following policies apply to the Embedded Security:

- Use Update mode only as instructed by Grass Valley product documentation or as directed by Grass Valley Support. Do not do any other operations with Embedded Security Manager, unless under the direct supervision of Grass Valley Support.
- Do not keep Embedded Security in Update mode long-term, as Embedded Security does extra processing while in Update mode and eventually problems arise when attempting to run software.
- Make sure that Embedded Security is not in Update mode when using SiteConfig to install software. Update mode interferes with SiteConfig's automatic management of Embedded Security and causes problems running the software installed.
- Leave Embedded Security enabled for normal operation of your Grass Valley system. Do not disable Embedded Security except as instructed by Grass Valley product documentation or as directed by Grass Valley Support. Enabling and disabling Embedded Security requires a restart.
- Do not install any programs or modify any operating system settings unless approved by Grass Valley. By design, Embedded Security prevents any programs from being installed or from running that are not present when you receive the system new from Grass Valley. These Grass Valley systems are not a general purpose Windows workstations. The applications and configuration have been specifically optimized on each system for its intended use as part of the Grass Valley system.

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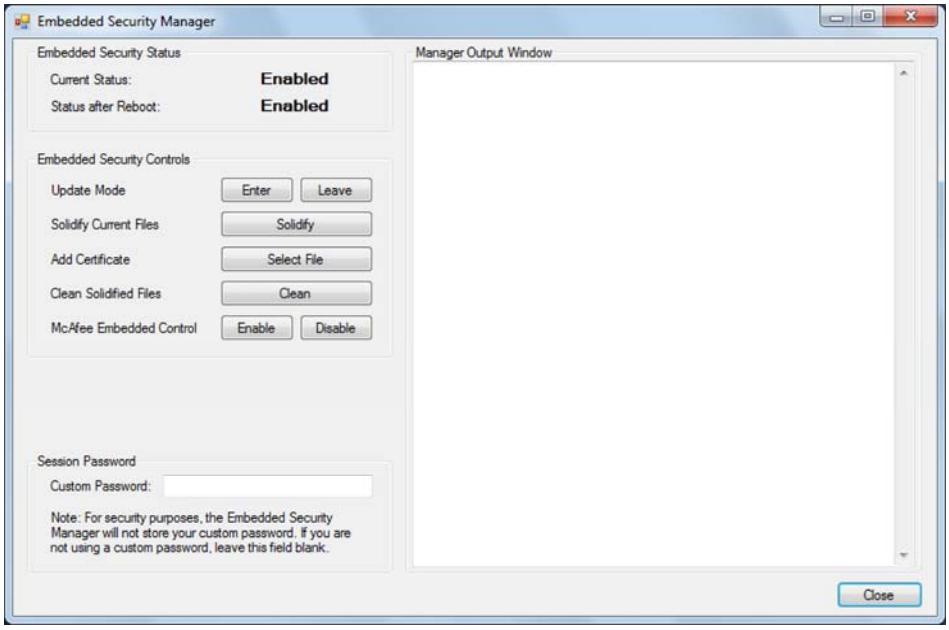
- While Embedded Security is the key anti-virus component on these systems, you should still follow the Grass Valley anti-virus scan policy and scan all the devices in your Grass Valley system to ensure viruses are not propagated between machines.

Embedded Security is part of the K2 Solo 3G system generic disk image and the K2 Media Server generic disk image compatible with K2 software version 9.0 or higher. Both K2 Media Servers and GV STRATUS servers use the same generic disk image, so GV STRATUS servers inherit the Embedded Security solution. On K2 Solo 3G systems, the Embedded Security solution introduced with K2 software version 9.0 replaces the write filter from previous versions.

Manage Embedded Security Update mode

1. From the Windows desktop, click **Start | All Programs | Grass Valley | Embedded Security Manager**.
   Embedded Security Manager opens.



   Interpret Current Status as follows:

   - **Enabled**: Embedded Security is not in Update mode and is enabled.
   - **Update**: Embedded Security is in Update mode and is enabled.

2. Manage the Update mode as follows:

   - If Embedded Security is not in Update mode, click **Enter** to put it in Update mode.
   - If Embedded Security is already in Update mode, click **Leave** to take it out of Update mode.

   A restart is not required after you change the Update mode.

Related Topics

Embedded Security modes and policies on page 46

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Replacing a RAID 0 drive

A K2 Solo Media Server's disk modules are configured as RAID 0, so when one drive fails, all media is lost. To replace a RAID 0 drive, do the following:

1. Unbind the LUN that has the failed drive.
2. Remove the failed drive from the K2 Solo 3G system chassis.
3. Insert the replacement drive in the K2 Solo 3G system chassis.
4. Restart the K2 Solo 3G system.
5. Using Storage Utility on the K2 Solo 3G system, bind disks as RAID 0.
6. Restart the K2 Solo 3G system.
7. Using Storage Utility on the K2 Solo 3G system, make a new file system.

   Restart as prompted.

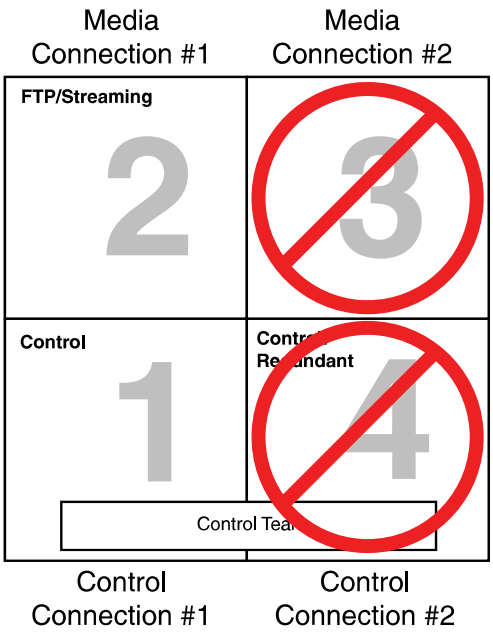
Always use the Storage Utility to physically identify the failed drive. To identify a drive, in Storage Utility right-click the drive and select **Identify**. This causes the disk lights to flash.

Refer to related topics in "K2 System Guide" for Storage Utility procedures.

To remove and insert a drive, refer to the mechanical procedure for disk module removal.

About networking

When you receive a K2 Solo 3G system from the factory, it has a specific network configuration, including a loopback adapter and two of the four Gigabit Ethernet ports configured as a teamed pair. The Gigabit Ethernet ports, as viewed when looking at the rear panel, are represented in the following illustration.



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Restoring network configuration

When you restore a system from its system specific image, network configuration is also restored to the factory default settings. This is the recommended method of restoring network configuration. However, if for some other reason you must configure network settings manually, use the tasks in this section to restore the default network configuration.

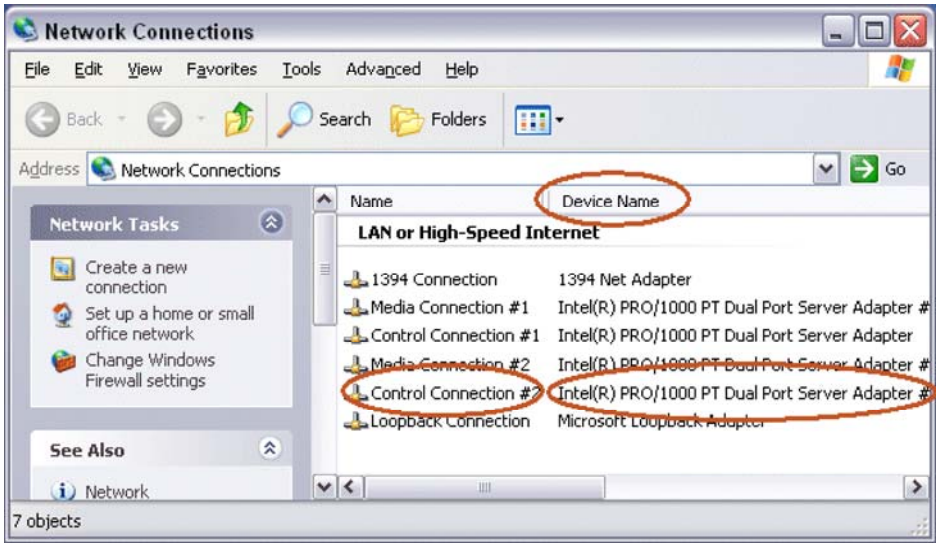
Create the Control Team

Before beginning this task, make sure of the following:

- Adapters are named

NOTE: Team control ports only. Do not team media ports.

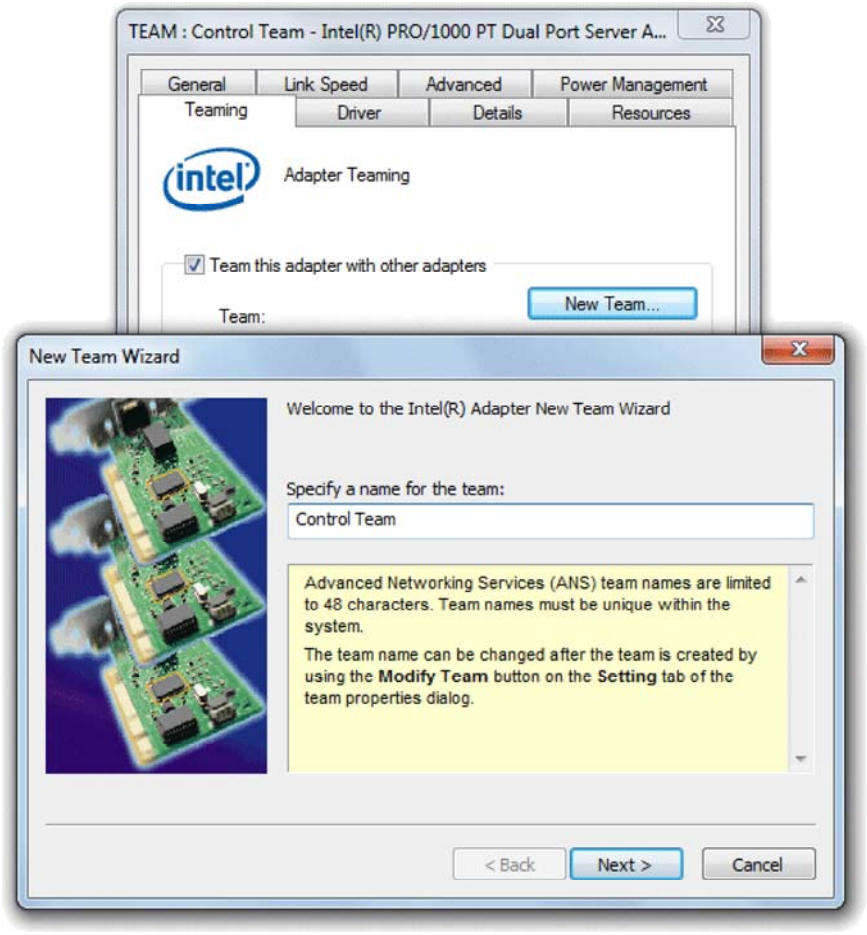
1. If K2 software is installed, disable the write filter, if it is not already disabled.
2. Open Network Connections, if it is not already open.
3. In Network Connections, in the Device Name column, identify the adapter name that maps to Control Connection #1 and the adapter name that maps to Control Connection #2.



4. In Device Manager, right-click the adapter name that maps to Control Connection #1.
5. Select **Properties**

   The Properties dialog box opens.

6. Select the **Teaming** tab.


TEAM : Control Team - Intel(R) PRO/1000 PT Dual Port Server A...
General
Link Speed
Advanced
Power Management
Teaming
Driver
Details
Resources
Adapter Teaming
Team this adapter with other adapters
Team:
New Team...
New Team Wizard
Welcome to the Intel(R) Adapter New Team Wizard
Specify a name for the team:
Control Team
Advanced Networking Services (ANS) team names are limited to 48 characters. Team names must be unique within the system.
The team name can be changed after the team is created by using the Modify Team button on the Setting tab of the team properties dialog.
< Back
Next >
Cancel

7. Select **Team this adapter with other adapters**, then click **New Team**. The New Team Wizard opens.

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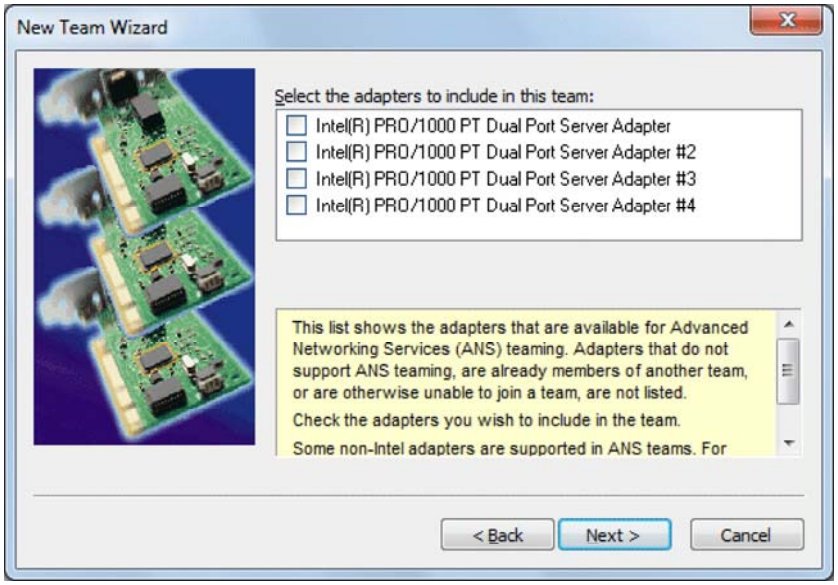
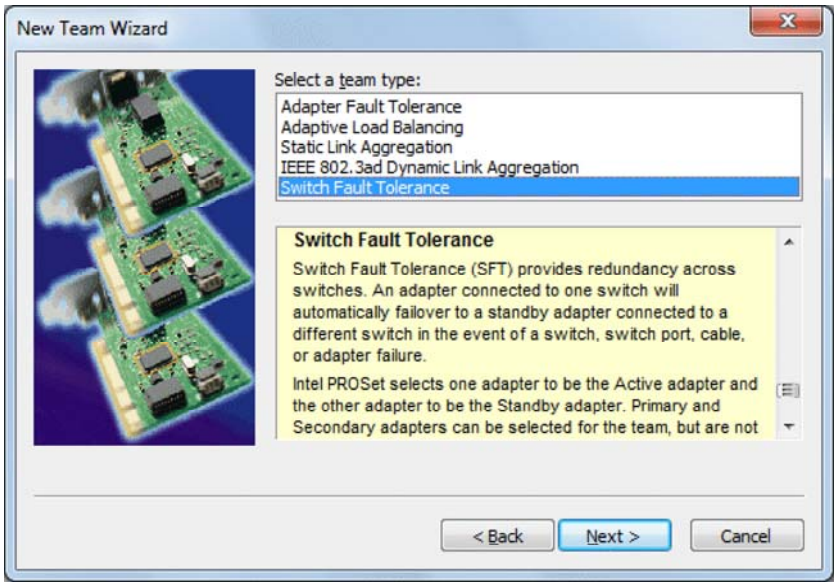
8. Enter Control Team.

   Click **Next**.


New Team Wizard
Select the adapters to include in this team:
Intel(R) PRO/1000 PT Dual Port Server Adapter
Intel(R) PRO/1000 PT Dual Port Server Adapter #2
Intel(R) PRO/1000 PT Dual Port Server Adapter #3
Intel(R) PRO/1000 PT Dual Port Server Adapter #4
This list shows the adapters that are available for Advanced Networking Services (ANS) teaming. Adapters that do not support ANS teaming, are already members of another team, or are otherwise unable to join a team, are not listed.
Check the adapters you wish to include in the team.
Some non-Intel adapters are supported in ANS teams. For
< Back
Next >
Cancel

9. Select the check box for the adapter name that maps to Control Connection #1 and for the adapter name that maps to Control Connection #2. Click **Next**.


New Team Wizard
Select a team type:
Adapter Fault Tolerance
Adaptive Load Balancing
Static Link Aggregation
IEEE 802.3ad Dynamic Link Aggregation
Switch Fault Tolerance
Switch Fault Tolerance
Switch Fault Tolerance (SFT) provides redundancy across switches. An adapter connected to one switch will automatically failover to a standby adapter connected to a different switch in the event of a switch, switch port, cable, or adapter failure.
Intel PROSet selects one adapter to be the Active adapter and the other adapter to be the Standby adapter. Primary and Secondary adapters can be selected for the team, but are not
< Back
Next >
Cancel

10. Select **Switch Fault Tolerance**. Click **Next**.
11. Click **Finish** and wait a few seconds for the adapters to be teamed.

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12. Open the Modify Team dialog box as follows:
    a) In **Device Manager | Network Adapters**, right-click **Control Team** and select **Properties**. The Properties dialog box opens.
    b) Select the **Settings** tab.
    c) Click **Modify Team**. A dialog box opens.
13. On the **Adapters** tab, do the following:
    a) Select the top entry, which is the adapter name that maps to Control Connection #1 and click **Set Primary**.
    b) Select the adapter name that maps to Control Connection #2 and click **Set Secondary**.
14. Click **OK** and **OK** and to close dialog boxes.
15. Restart the K2 Solo 3G system.

Next, proceed as follows:

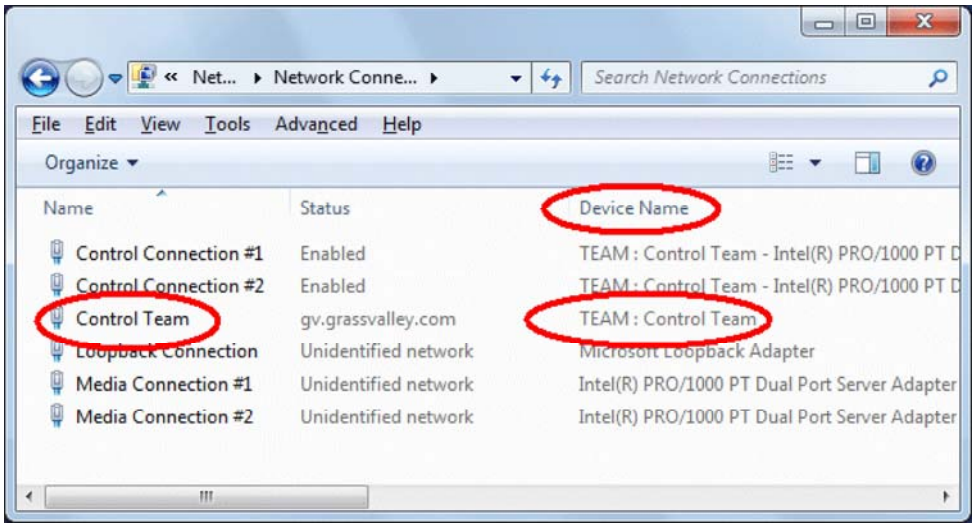
- If network configuration is complete, enable the write filter.
- If continuing with network configuration, your next task is to name team and loopback.

Name team and loopback

Before beginning this task, make sure of the following:

- Adapters are named
- The control team is created

1. If K2 software is installed, disable the write filter, if it is not already disabled.
2. On the Windows desktop right-click **Start | Control Panel | Network and Sharing Center | Change adapter settings**. The Network Connections window opens.



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3. For the Control Team and the loopback, select adapter names in the "Device Name" column and rename them as follows:
   a) Select the adapter name.
   b) Select **File | Rename** to enter rename mode.
   c) Type the name, as specified in the following table:

In the Device Name column, select this adapter name…	And rename it as follows:
TEAM : Control Team	Control Team

4. Do one of the following:
   - If you intend to use SiteConfig for device discovery and IP address configuration, you do not need to set an IP address for the Control Team at this time. You are done with this procedure.
   - If you are not using SiteConfig, set an IP address for the Control Team at this time. Use standard Windows procedures.

   NOTE: Do not set IP addresses for the two Media Connections.

Next, proceed as follows:

- If network configuration is complete, enable the write filter.
- If continuing with network configuration, your next task is to reorder adapters.

Reorder adapters

Before beginning this task, make sure of the following:

- Adapters are named correctly according to their PCI bus location
- The control team is created
- The team and loopback are named

1. If K2 software is installed, disable the write filter, if it is not already disabled.
2. On the Windows desktop right-click **My Network Places** and select **Properties**.
   The Network Connections window opens.
3. Select **Advanced**, then **Advanced Settings…**

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4. On the **Adapters and Bindings** tab, depending on the K2 system storage, order adapters as follows:

Internal or direct-connect storage	Shared (SAN) storage
Loopback	Control Team
Control Team	Control Connection #1
Control Connection #1	Control Connection #2
Control Connection #2	Media Connection #1
Media Connection #1	Media Connection #2
Media Connection #2	Loopback
1394 Connection	1394 Connection

   If controlled by Dyno Production Assistant, refer to Dyno PA documentation for adapter order.

5. Click **OK** to close and accept the changes.
6. Close Network Connections.

Enable the write filter. Network configuration is complete.

Checking services

Depending on storage type (standalone or shared) of the K2 Solo 3G system, various services are turned off or on or set to different startup types. These services are automatically set by the K2 Solo 3G system software installation program and by the Status Server service whenever the K2 Solo 3G system starts up.

***NOTE: Do not manually change the way services run on a* K2 Solo 3G system.**

If you suspect that services have been tampered with or for any reason are not set correctly, you can check their current settings in the Windows Services Control Panel. The table below provides the settings for the services that are critical to a correctly operating K2 Solo 3G system.

Services on a standalone storage K2 Solo 3G system

When a standalone K2 Solo 3G system with internal storage or a K2 Solo 3G system with direct-connect storage is operating normally, in the Services control panel services appear as follows:

Service	Status	Startup Type	Comments
CvfsPM[1]	Started	Automatic	—
Grass Valley AppService	Started	Automatic	Depends on Status Server service.

[1] With SNFS version 3.5, this is the only service. Previous versions had StorNext File System service and StorNext File System RPC Port Mapper service.

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Service	Status	Startup Type	Comments
Grass Valley Extent Manager Service	Started	Manual	Used to consolidate unused space (extents) at the end of proxy clips on an SNFS file system. Does not apply to non-SNFS file systems.
Grass Valley FTP Daemon	Started	Manual	Started by Status Server service on standalone storage models.
Grass Valley Host File Service	Started	Automatic	—
Grass Valley HTTP File Server	Started	Manual	Provides access to live streaming configuration (SDP) files.
Grass Valley Import Service	—	Manual	This is the service that provides the functionality for a K2 capture service. It is the service that automatically creates the K2 clip from the media files in the watched folder (source directory) and puts the K2 clip in the K2 media storage (destination bin).
Grass Valley K2 Config	Started	Automatic	Not used on standalone storage K2 Solo 3G system.
Grass Valley MegaRaid Server	—	Manual	—
Grass Valley MetaDataService	Started	Manual	—
Grass Valley RTS Config Service	Started	Manual	—
Grass Valley SabretoothWS	—	Manual	Allows Macintosh systems to remotely check out a license.
Grass Valley Storage Utility Host	Started	Automatic	—
Grass Valley System Status Server	Started	Automatic	At startup the Status Server service makes sure the following services are started:-AMP TCP Service-AppService-FTP Daemon.
GV STRATUS Summit Services	Started	Automatic	Required if part of a STRATUS system.
Microsoft iSCSI Initiator Service	Started	Automatic	Not used on a standalone storage K2 Solo 3G system.
ProductFrame Discovery Agent Service	Started	Automatic	—
Sabretooth License Server	Started	Manual	—
Sabretooth Protocol Service	—	Manual	—

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Checking pre-installed software

Software is pre-installed on K2 products when you receive them from the factory. This load of pre-installed software is referred to as the “golden drive”. The following list is an example of the software pre-installed. Check "K2 Release Notes" for the most up-to-date list with version information.

If you suspect that pre-installed software is not correct, use the recovery process to re-load the software. Do not attempt to un-install, install, or repair pre-installed software without guidance from your Grass Valley Support representative.

K2 Solo 3G system pre-installed software

- Intel Pro Software
- QuickTime
- Microsoft iSCSI Initiator
- MS XML
- .NET Framework
- MegaRAID — Do not use this utility on a K2 Solo 3G system. This utility is for use by qualified Grass Valley Service personnel only. When this utility is opened it scans the SCSI bus and interferes with record and play operations.
- J2SE Runtime Environment
- StorNext software
- Windows PowerShell
- Windows XP Embedded

Making CMOS settings

NOTE: This procedure is intended for use by Grass Valley Service personnel or under the direct supervision of Grass Valley Service personnel.

1. Connect keyboard, monitor, and mouse to the K2 Solo 3G system.
2. Restart the K2 Solo 3G system.
3. During the BIOS startup screen, watch the keyboard lights (capslock, numlock, etc.). When the lights flash, press **Delete** to enter Setup.
4. Press **F3** and then press **Enter**. This loads optimal default values for all the setup questions.
5. Press **F4** and then press **Enter** to save settings and restart.

Restoring disk controller configuration

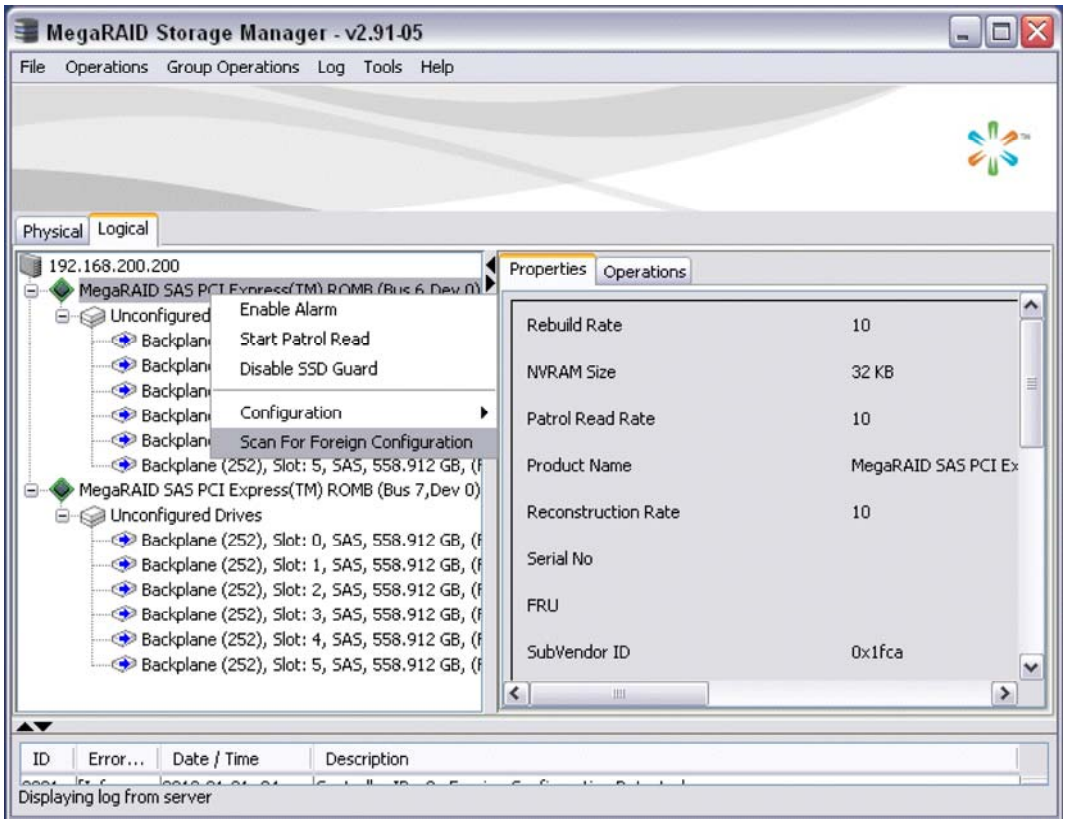
Do this task when replacing the disk controller board.

This task can be used on any K2 Solo 3G system, but it is required on any system that has a Type II (ADLINK) CPU carrier module. This includes the first generation K2 Summit system, which can have a Type II CPU carrier module that was installed in the factory or that was upgraded in the field.

NOTE: This procedure is intended for use by Grass Valley Service personnel or under the direct supervision of Grass Valley Service personnel.

After you replace a disk controller board, you must import the configuration information from the existing disks. This allows the new board to see the LUNs as previously configured.

1. After replacing the disk controller board, power up the K2 Solo 3G system.
   Ignore SNFS messages that can open at any time during this procedure.
2. On the Windows desktop, open the **MegaRAID Storage Manager** icon.
3. When prompted, enter administrator credentials.
   The MegaRAID Storage Manager main window opens.



4. In the MegaRAID Storage Manager main window tree-view, verify that drives are reported as "Unconfigured Drives".

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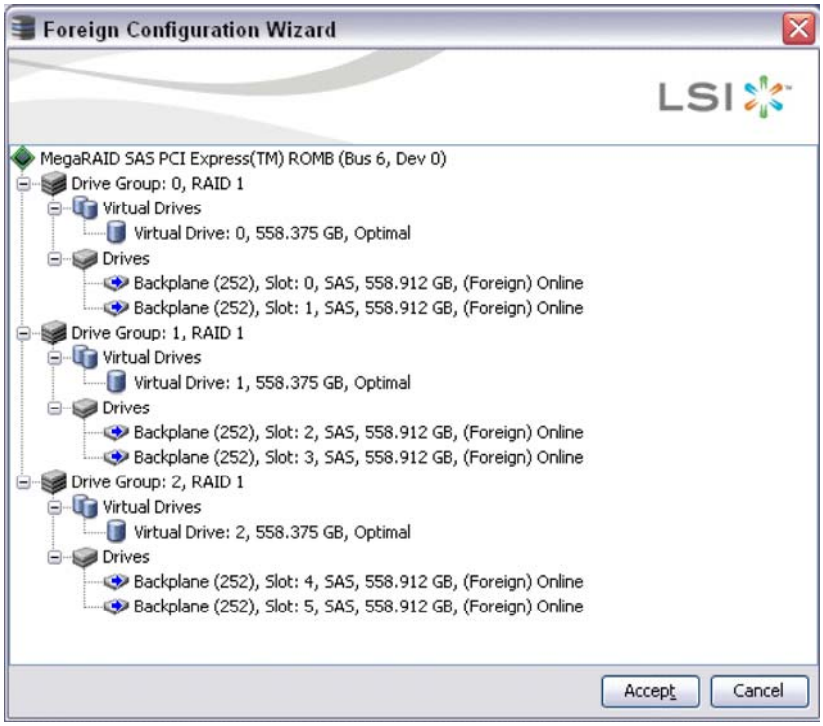
5. In the tree-view, right-click the top controller and select **Scan For Foreign Configuration**.
   A Foreign Configuration Detected dialog box opens.

Foreign Configuration Detected
6 Foreign drives were detected. You must import or clear these drives before they can be used.
Choose an option:
Import: Import logical configuration from all foreign drives.
Clear: Remove logical configuration from all foreign drives.
Advanced: Preview, import and clear specific foreign configurations.
Ok
Cancel

6. Make sure **Import** is selected and click **OK**.
   A Foreign Configuration Wizard opens.


Foreign Configuration Wizard
LSI
MegaRAID SAS PCI Express(TM) ROMB (Bus 6, Dev 0)
Drive Group: 0, RAID 1
Virtual Drives
Virtual Drive: 0, 558.375 GB, Optimal
Drives
Backplane (252), Slot: 0, SAS, 558.912 GB, (Foreign) Online
Backplane (252), Slot: 1, SAS, 558.912 GB, (Foreign) Online
Drive Group: 1, RAID 1
Virtual Drives
Virtual Drive: 1, 558.375 GB, Optimal
Drives
Backplane (252), Slot: 2, SAS, 558.912 GB, (Foreign) Online
Backplane (252), Slot: 3, SAS, 558.912 GB, (Foreign) Online
Drive Group: 2, RAID 1
Virtual Drives
Virtual Drive: 2, 558.375 GB, Optimal
Drives
Backplane (252), Slot: 4, SAS, 558.912 GB, (Foreign) Online
Backplane (252), Slot: 5, SAS, 558.912 GB, (Foreign) Online
Accept
Cancel

7. Click **Accept**.
8. When prompted "...import?", click **Yes**.
9. When informed "...imported successfully", click **Yes**.

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10. In the MegaRAID Storage Manager main window tree-view, verify that one controller reports configured drives and one controller reports unconfigured drives.
11. For the controller with unconfigured drives, repeat previous steps to import the foreign configuration.
12. When you have imported the foreign configuration for both controllers, click **File | Exit** to close MegaRAID Storage Manager.
13. Restart the K2 Solo 3G system.

Related Topics

Disk controller board removal on page 93

Recovering the media database

This section provides topics about recovering the media database.

About the automatic database backup process

Every 15 minutes the K2 system checks to see if any media operations have changed the media database. If a change has occurred, the K2 system creates a backup file of the media database. The backup file is saved in the same directory as the media database using a rotating set of three file names. These files are named *media.db_bakX* where X is the number in the rotation. Each time a backup occurs, the oldest backup file is overwritten. If some condition renders one of the backup files un-writable, the backup file following that in the rotation is subsequently used for every backup until the condition is resolved.

Identifying a corrupt media database

The following symptoms could indicate a corrupt media database:

- On startup, the Grass Valley MetaDataService is unable to start. This is indicated in the Services control panel if the Grass Valley MetaDataService does not display as Started.
- The K2 log displays a "…file is encrypted or is not a database…" error.

As soon as you suspect a corrupt media database, stop all media access and take the K2 system offline.

Restoring the media database

1. Stop all media access and take the K2 system offline.
2. Navigate to the V:\media directory.
3. Make a copy of the media.db and media.db_bak* files and store them in a secure location.
4. Stop the Grass Valley MetaDataService as follows:

   For the standalone K2 system, use the Services control panel to stop the service.
5. Determine which backup file is the most recent good file by examining the file modification date on each backup file.
6. Rename the current *media.db* file (which is assumed to be corrupt) to another name, and rename the most recent good *media.db_bakX* file to *media.db*.

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7. Restart the K2 system following normal procedures.
8. Confirm that the systems come up correctly with the restored database now in place.
9. Use Storage Utility **Clean Unreferenced Files** and **Clean Unreferenced Movies** to repair any inconsistencies between the contents of the database and the file system.

Using recovery images

This section provides topics about using recovery images.

About the recovery image process

An image of the K2 Solo 3G system system drive is provided with the product package. You can restore the K2 Solo 3G system from this image. This simplifies the process of rebuilding a system in a disaster recovery scenario.

NOTE: This process is not intended as a means to backup and restore media.

When you receive your K2 Solo 3G system new from the factory, you receive a system-specific image for that particular K2 Solo 3G system. This factory image is stored on a bootable USB Recovery Flash Drive. Also on the Recovery Flash Drive is the Acronis True Image software necessary to create and restore an image. You can find the Recovery Flash Drive in a holder in the front bezel assembly.

After your K2 Solo 3G system is installed, configured, and running in your system environment, you should create a new recovery image to capture settings changed from default. This "first birthday" image is the baseline recovery image for the K2 Solo 3G system in its life in your facility. There is enough space on the Recovery Flash Drive to store the first birthday image along with the factory image.

You should likewise create a new recovery image after completing any process that changes system software or data, such as a software upgrade. In this way you retain the ability to restore your K2 Solo 3G system to a recent "last known good" state.

You can also use the recovery image process on the control point PC.

NOTE: The recovery image process is an "off-line" process. Do not attempt this process while media access is underway.

The recovery image process that you should follow is summarized in the following steps.

- **At the K2 Solo 3G system first birthday…**

  Boot from the Recovery Flash Drive.

  Create a recovery image for the K2 Solo 3G system.

  Create a recovery image for the Control Point PC.

- **At milestones, such as software upgrades…**

  Boot from the Recovery Flash Drive.

  Create a recovery image for the K2 Solo 3G system.

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- **If you need to restore the K2 Solo 3G system…**

  Boot from the Recovery Flash Drive.

  Read the image from the Recovery Flash Drive or from the location that you stored the image.

- **If you need to restore the Control Point PC…**

  Boot from the Recovery Flash drive.

  Read the image from the location that you stored the image.

Use the following procedures to implement the recovery image process as necessary.

Creating a recovery image

Before creating a recovery image, determine the storage location for the image. Grass Valley recommends that you store the recovery image on the Recovery Flash Drive, and this task provides instructions for that location. If you use a different location, such as a network connected drive or another connected USB drive, alter the steps in this task as appropriate.

1. Make sure that media access is stopped and that the system on which you are working is not being used.
2. If you have not already done so, connect keyboard, monitor, and mouse.
3. Do the following:
   a) Insert the Recovery Flash Drive into a USB port.
   b) Restart the machine, or power on if currently shut down.

      The machine boots from the Recovery Flash Drive, into a version of Windows stored on the drive.

      A MS-DOS command window opens.

   c) When prompted with a list of options, type `2` to select the Acronis option and then press **Enter**.

   The Acronis program loads.
4. In the Acronis main window, click **Backup**.

   The Create Backup Wizard opens.
5. On the Welcome page, click **Next**.
6. On the Partitions Selection page, do the following:
   a) Select the **(C:)** partition and then click **Next**.

      NOTE: Verify capacity to make sure you select the boot media card (CompactFlash or mSATA) and not a media drive. The boot media has a much smaller capacity.

      If a "…choose full backup mode…" message appears, click **OK**.

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7. On the Backup Archive Location page, do the following:
   a) in the tree view select **Removable Disk (D:)** and enter the name of the image file you are creating.

      Create the file name using the machine hostname and the date. Name the file with the .tib extension.

      For example, if the hostname is MySystem1, in the File name field you enter `A:\MySystem1_20121027.tib`.

   b) Click **Next**.
8. On the Select Backup Mode page, select **Create a new full backup archive** and then click **Next**.
9. On the Backup Options page, do not change any settings. Click **Next**.
10. On the Archive Comment page, if desired, enter image comments such as the date, time, and software versions contained in the image you are creating. Click **Next**.
11. On the "…ready to proceed…" page, do the following:
    a) Verify that you are creating an image from the C: drive and writing to the D:\ drive, then click **Proceed**.

       If a "...insert next volume..." message appears, click **OK**.

12. On the Operation Progress page, observe the progress report.
13. When a message appears indicating a successful backup, click **OK**.
14. Click **Operations | Exit** to exit the Acronis True Image program.

    The machine restarts automatically.
15. Remove the recovery media while the machine is shutting down.

Restoring from a system-specific recovery image

Use this task to restore a K2 Solo 3G system using an image made from that particular K2 Solo 3G system. If restoring from a generic factory default image, use the appropriate task.

Before restoring from a recovery image, make sure that the K2 Solo 3G system has access to the image from which you are restoring. This task provides instructions for accessing an image on the Recovery Flash Drive. If you access an image from a different location, such as a network connected drive or another connected USB drive, alter the steps in this task as appropriate.

1. Make sure that media access is stopped and that the system on which you are working is not being used.
2. If you have not already done so, connect keyboard, monitor, and mouse.
3. Do the following:
   a) Insert the Recovery Flash Drive into a USB port.
   b) Restart the machine, or power on if currently shut down.

      The machine boots from the Recovery Flash Drive, into a version of Windows stored on the drive.

      A MS-DOS command window opens.

   c) When prompted with a list of options, type `2` to select the Acronis option and then press **Enter**.

   The Acronis program loads.

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4. In the Acronis main window, click **Recovery**.

   The Restore Data Wizard opens.

5. On the Welcome page, click **Next**.
6. On the Backup Archive Selection page, in the tree view expand the node for **Removable Disk (D:)** and select the image file, then click **Next**.
7. On the Restoration Type Selection page, select **Restore disks or partitions** and then click **Next**.
8. On the Partition or Disk to Restore page, select **MBR and Track 0** and then click **Next**.
9. On the Disk Selection page, select **Disk 1** and then click **Next**.

   NOTE: Verify capacity to make sure you select the boot media card.

10. On the Next Selection page, select **Yes, I want to restore another partition or hard disk drive** and then click **Next**.
11. On the Partition or Disk to Restore page, select **(C:)** and then click **Next**.
12. On the Restored Partitions Resizing page, select **Yes, I want to resize partitions** and then click **Next**.
13. On the Restored Location page, select **(C:)** and then click **Next**.

    NOTE: Verify capacity to make sure you select the boot media card (CompactFlash or mSATA) and not a media drive. The boot media has a much smaller capacity and has an interface identified as "IDE (0) Primary Master".

14. On the Restored Partition Type page, select **Active** and then click **Next**.
15. Do one of the following:

    - If the Restored Partition Size page does not appear. Skip ahead to the Next Selection page.
    - If the Restored Partition Size page appears. Continue with the next step.

16. On the Restored Partition Size page, do one of the following:

    - If **Free space after** reports 0 bytes, leave settings as they are. Click **Next**.
    - If **Free space after** does not report 0 bytes, increase **Partition size** until **Free space after** reports 0 bytes. Click **Next**.

17. On the Next Selection page, select **No, I do not** and then click **Next**.
18. On the Restoration Options page, do not make any selections. Click **Next**.
19. On the "…ready to proceed…" page, verify that you are restoring the correct image to the correct location. Click **Proceed**.
20. On the Operation Progress page, observe the progress report.
21. When a message appears indicating a successful recovery, click **OK**.
22. Click **Operations | Exit** to exit the Acronis True Image program.

    The machine restarts automatically.

23. Remove the recovery media while the machine is shutting down.

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24. When prompted, enter the K2 Solo 3G system machine name.

    Make sure the name is identical to the name it previously had.

    After start up, one or more device discovery windows can open. Allow processes to complete without interference. If a Fibre Channel card driver, ignore until instructed later in this process.

    At first start up after reimage, the system is in Embedded Security Update mode by default.

Next, check the adapter names and order. If adapter names and order are not as documented, restore network configuration.

Related Topics

Reorder adapters on page 53

Restoring network configuration on page 49

About saving and restoring settings while reimaging

If you are reimaging a K2 Solo 3G system with a generic disk image, you can run scripts to save the media file system and other settings before the reimage, then restore the settings after the reimage. Setting are saved and restored as follows:

- Media file system (SNFS): You run scripts to save and restore these settings. After the settings are restored, on a standalone system you can access the media in the local media storage. On a SAN-attached system, K2Config settings are restored so you can access media on the shared media storage.
- SID, computer name, and network settings: You run the script to save settings to a text file, so you can manually reconfigure as desired after the reimage.

If the media file system and settings are valid (not corrupt) on the K2 Solo 3G system before the reimage, it is recommended that you use the save/restore scripts to save your media and settings, thus saving time in the reimage process. However, if the media file system or settings are corrupt and your purpose for reimaging is to remove the corruption, it is likely that you do not want to use the save/restore scripts.

Saving settings before generic reimage

1. If you are working on a K2 client SAN-attached system, on the K2 SAN's control point PC, use the K2Config application to remove the K2 client system from the SAN.
2. Make sure you are logged in to the K2 Solo 3G system with administrator privileges.
3. Connect the USB Recovery Flash Drive to a USB port on the K2 Solo 3G system.
4. On the USB Recovery Flash Drive, navigate to the following location:

   `\tools\SaveRestoreScripts.`

5. Run the following and wait for the process to complete:

   `ssave.bat`

   This saves current settings onto the USB Recovery Flash Drive in the `\settings` directory.

6. Disconnect the USB Recovery Flash Drive.

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Restoring from a generic image

This task can be used on a K2 Solo 3G system that needs to be restored to its factory default state. For example, if you neglected to make a first birthday image, you might need to use this procedure. If the image from which you are restoring was made from the specific machine, refer to the appropriate procedure.

This task provides instructions for accessing an image on the Recovery Flash Drive. If you access an image from a different location, such as a network connected drive or another connected USB drive, alter the steps in this task as appropriate. There can be multiple versions of the generic recovery disk image on the Recovery Flash Drive. Refer to related topics in "K2 Release Notes" to determine which version you should use.

NOTE: This procedure restores the* K2 Solo 3G system *to its factory default condition. Passwords and other site-specific configurations are reset to factory defaults.

1. Make sure that media access is stopped and that the system on which you are working is not being used.
2. If you have not already done so, connect keyboard, monitor, and mouse.
3. Do the following:
   a) Insert the Recovery Flash Drive into a USB port.
   b) Restart the machine, or power on if currently shut down.

      The machine boots from the Recovery Flash Drive, into a version of Windows stored on the drive.

      A MS-DOS command window opens.

   c) When prompted with a list of options, type `2` to select the Acronis option and then press **Enter**.

   The Acronis program loads.
4. In the Acronis main window, click **Recovery**.

   The Restore Data Wizard opens.
5. On the Welcome page, click **Next**.
6. On the Backup Archive Selection page, in the tree view expand the node for **Removable Disk (D:)** and select the image file, then click **Next**.
7. On the Restoration Type Selection page, select **Restore disks or partitions** and then click **Next**.
8. On the Partition or Disk to Restore page, select **MBR and Track 0** and then click **Next**.
9. On the Disk Selection page, select **Disk 1** and then click **Next**.

   NOTE: Verify capacity to make sure you select the boot media card.
10. On the Next Selection page, select **Yes, I want to restore another partition or hard disk drive** and then click **Next**.
11. On the Partition or Disk to Restore page, select **(C:)** and then click **Next**.
12. On the Restored Partitions Resizing page, select **Yes, I want to resize partitions** and then click **Next**.
13. On the Restored Location page, select **(C:)** and then click **Next**.

    NOTE: Verify capacity to make sure you select the boot media card (CompactFlash or mSATA) and not a media drive. The boot media has a much smaller capacity and has an interface identified as "IDE (0) Primary Master".

14. On the Restored Partition Type page, select **Active** and then click **Next**.
15. Do one of the following:
    - If the Restored Partition Size page does not appear. Skip ahead to the Next Selection page.
    - If the Restored Partition Size page appears. Continue with the next step.
16. On the Restored Partition Size page, do one of the following:
    - If **Free space after** reports 0 bytes, leave settings as they are. Click **Next**.
    - If **Free space after** does not report 0 bytes, increase **Partition size** until **Free space after** reports 0 bytes. Click **Next**.
17. On the Next Selection page, select **No, I do not** and then click **Next**.
18. On the Restoration Options page, do not make any selections. Click **Next**.
19. On the "…ready to proceed…" page, verify that you are restoring the correct image to the correct location. Click **Proceed**.
20. On the Operation Progress page, observe the progress report.
21. When a message appears indicating a successful recovery, click **OK**.
22. Click **Operations | Exit** to exit the Acronis True Image program.

    The machine restarts automatically.
23. Remove the recovery media while the machine is shutting down.
24. Upon startup, wait for initialization processes to complete. This can take several minutes, during which time USB keyboard/mouse input is not operational. The system might automatically restart. Do not attempt to shutdown or otherwise interfere with initialization processes.
25. When prompted, enter the K2 Solo 3G system machine name.

    Make sure the name is identical to the name it previously had.

    After start up, one or more device discovery windows can open. Allow processes to complete without interference. If a Fibre Channel card driver, ignore until instructed later in this process.

    At first start up after reimage, the system is in Embedded Security Update mode by default.

Next, check the adapter names and order. If adapter names and order are not as documented, restore network configuration.

Restoring settings after generic reimage

This task assumes that you have saved settings using *ssave.bat* before reimaging the K2 Solo 3G system, and that the reimage (Acronis) process is complete.

1. If you have not already done so, start up the K2 Solo 3G system and log on with administrator privileges.

   The administrator password is `adminGV!`.
2. Connect the USB Recovery Flash Drive to a USB port on the K2 Solo 3G system.
3. From the USB Recovery Flash Drive, run the following and wait for the process to complete:

   Tools\SaveRestoreScripts\srestore.bat

Next, do the following as appropriate to restore your K2 Solo 3G system. Refer to related topics in this document or as otherwise indicated.

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1. Restore network configuration. If you saved settings with `ssave.bat`, refer to `C:\ipconfig.txt` for the complete listing of the network settings that the K2 Solo 3G system had before reimaging.
2. Install the SiteConfig Discovery Agent.
3. If you install software with SiteConfig, do the following:
   - Take Embedded Security out of Update mode.
   - Install SNFS software and K2 software using SiteConfig.
   - Restore SabreTooth licenses.
4. If you install software manually (without SiteConfig), do the following:
   - Install SNFS software and K2 software manually.
   - Take Embedded Security out of Update mode.
   - Restore SabreTooth licenses.

   If you saved/restored settings with `ssave.bat` and `srestore.bat`, SNFS uses the restored settings. Refer to related topics in "K2 Release Notes".
5. Check the Windows operating system clock, and if necessary, set it to the correct time.
6. Activate Windows within 30 days.

Related Topics

Embedded Security modes and policies on page 46

Installing the Discovery Agent on a K2 Solo system

If the device that you plan to manage with SiteConfig does not have a SiteConfig Discovery agent installed, use this topic to verify and, if necessary, manually install SiteConfig support software. Doing so allows SiteConfig to discover and manage the device. If the device has any version of the SiteConfig Discovery Agent currently installed, you should use SiteConfig to upgrade the Discovery Agent, rather than installing it manually.

1. On the device you plan to manage with SiteConfig, open the Windows Services Control Panel and look for the following required item:
   - ProductFrame Discovery Agent
2. Proceed as follows:
   - If you find the required items, no further steps are necessary. SiteConfig support software is installed.
   - If a required item is not present, navigate to your SiteConfig files. If you do not already have these files in convenient location, you can find them on the PC that hosts SiteConfig, in the SiteConfig install location. Then continue with next steps as appropriate.
3. To launch the program that installs the ProductFrame Discovery Agent Service do the following:
   a) Copy the `Discovery Agent Setup` directory to the device.
   b) In the directory, double-click the `DiscoveryAgentServiceSetup.msi` file.
      The setup program launches to install the SiteConfig Discovery Agent.
   c) Follow the setup wizard.
4. When presented with a list of device types, select the following:
   - K2SoloStandaloneClient

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5. Complete the setup wizard and restart the device.
   The restart is required after the installation.

Using diagnostic tools

Use the following sections as necessary to identify problems.

Running Check Disk

If your K2 Solo 3G system has a critical system fault, you should run Check Disk to identify and remove any corrupted files.

1. Make sure the K2 Solo 3G system has no media access currently underway.
2. At the MS-DOS command prompt, enter the following and press **Enter**.
   ```
   chkdsk
   ```
   Check Disk reports file system information and lists any problem found.
3. Do one of the following:
   - If Check Disk does not report any problems, close the command prompt window. Do not complete the remaining steps of this procedure.
   - If Check Disk reports a problem and prompts you to repair, continue with this procedure.
4. When prompted to repair problems, do the following:
   a) Press the **Y** key and then press **Enter**.
   b) Enter the following and press **Enter**.
      ```
      chkdsk /F
      ```
      The screen displays a message similar to the following:
      ```
      ...Cannot lock current drive. Chkdsk cannot run because the volume
      is in use by another process. Would you like to schedule this volume
      to be checked the next time the system restarts? (Y/N)
      ```
   c) Press the **Y** key and then press **Enter**.
5. Restart the K2 Solo 3G system.

Running diagnostics for K2 Solo 3G system

If you suspect a problem with K2 Solo 3G system hardware, you can run diagnostics and check for errors.

1. Make sure all media access is stopped on the K2 Solo 3G system. Also make sure that there is nothing preventing a restart, as it is required after you run diagnostics.
2. From the Windows desktop, click **Start | All Programs | Grass Valley | Diagnostics**.
   The Summit Diagnostics application opens.

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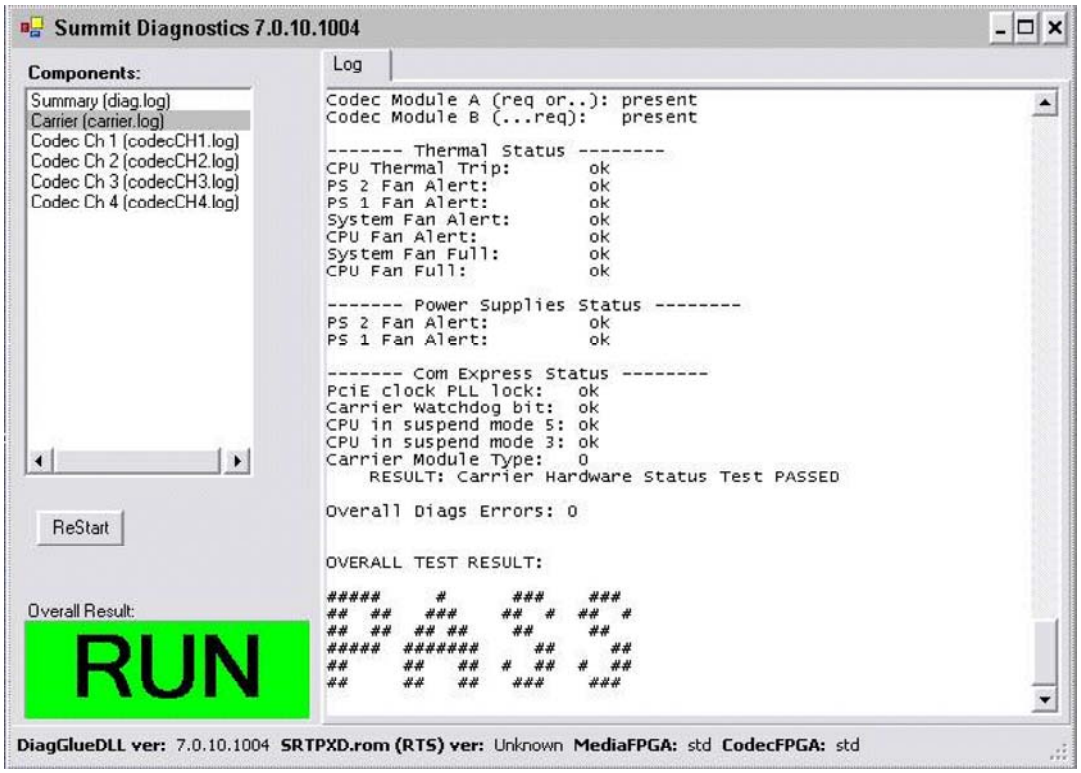
3. Click **Start**.

   The Overall Result indicator displays RUN while diagnostics are underway.


Summit Diagnostics 7.0.10.1004
Components:
Summary (diag.log)
Carrier (carrier.log)
Codec Ch 1 (codecCH1.log)
Codec Ch 2 (codecCH2.log)
Codec Ch 3 (codecCH3.log)
Codec Ch 4 (codecCH4.log)
ReStart
Overall Result:
RUN
Log
Codec Module A (req or..): present
Codec Module B (...req): present
------- Thermal Status --------
CPU Thermal Trip: ok
PS 2 Fan Alert: ok
PS 1 Fan Alert: ok
System Fan Alert: ok
CPU Fan Alert: ok
System Fan Full: ok
CPU Fan Full: ok
------- Power Supplies Status --------
PS 2 Fan Alert: ok
PS 1 Fan Alert: ok
------- Com Express Status --------
PciE clock PLL lock: ok
Carrier Watchdog bit: ok
CPU in suspend mode S: ok
CPU in suspend mode 3: ok
Carrier Module Type: 0
RESULT: Carrier Hardware Status Test PASSED
Overall Diags Errors: 0
OVERALL TEST RESULT:
DiagGlueDLL ver: 7.0.10.1004 SRTPXD.rom (RTS) ver: Unknown MediaFPGA: std CodecFPGA: std

   When diagnostics complete, the Overall Result indicator reports results as follows:

   - PASS – There are no problems reported in the diagnostic logs.
   - FAIL – There are one or more problems reported in one or more diagnostic logs.

4. To view a diagnostic log, in the Components list, select a log.

   The log's contents appear in the Log pane.

5. To close the Summit Diagnostics application, allow any currently running diagnostics to complete, then click the window close button (**X**) in the upper right corner of the application window.

   A "...should be restarted..." message appears.

6. Click **OK** and then restart the K2 Solo 3G system.

   You must restart before you can use the K2 Solo 3G system. Running diagnostics puts the real time processor and other services in a non-production state.

USO RESTRITO

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Chapter 4

Troubleshooting problems

This section contains the following topics:

- *Step 1: Check configurations*
- *Step 2: Check connections and external equipment*
- *Step 3: Check system status messages*
- *Step 4: Identify problems using the startup sequence*
- *Shutdown/restart problems*
- *Checking external equipment*
- *Power connection sequence*
- *BIOS startup*
- *Windows startup*
- *K2 Solo 3G system startup*
- *Windows startup problems*
- *Thermal problems*
- *Codec board problems*
- *Power supply problems*
- *Video problems*
- *Audio problems*
- *Timecode problems*
- *Operational problems*
- *System problems*
- *Storage problems*
- *Network, transfer, and streaming problems*

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Step 1: Check configurations

Many times what appears to be a K2 Solo 3G system fault is actually an easy-to-fix configuration problem. Check settings in Configuration Manager and verify that the system is configured as you expect. Refer to related topics in "K2 AppCenter User Manual" and "K2 System Guide".

Step 2: Check connections and external equipment

Loose or improperly connected cables are the most likely source of problems for the system. A quick check of all the cable connections can easily solve these problems. Refer to related topics in "K2 System Guide" for help with making connections. Check external equipment if you suspect a failure in a device connected to the K2 Solo 3G system.

Related Topics

Checking external equipment on page 74

Step 3: Check system status messages

While the K2 Solo 3G system is in operation, some problems are detected and reported in system status messages. To view system status messages, in AppCenter select **Help | System Status**.

When connecting to a K2 Solo 3G system from a control point PC using remote AppCenter, if there is an AppCenter system startup error, the error is reported during the connection attempt.

If the system status message indicates a problem, refer to related topics in "K2 Summit Production Client Service Manual".

NOTE: Do not use the MegaRAID utility on a* K2 Solo 3G system*. This utility is for use by qualified Grass Valley Service personnel only. When this utility is opened it scans the SCSI bus and interferes with record and play operations.

Related Topics

Viewing AppCenter system status messages on page 39

Step 4: Identify problems using the startup sequence

The startup sequence is your primary tool for identifying a K2 Solo 3G system fault. As the different levels of the K2 Solo 3G system system become operational in the startup process, the primary components of the system are checked. You can identify most problems by evaluating the messages and other indicators that occur during the startup sequence.

NOTE: This procedure assumes that the* K2 Solo 3G system *is not in Storage Utility's "offline" mode.

To identify problems using the startup sequence, do the following:

1. Connect mouse, keyboard, and monitor. You must observe the VGA screen and be able to interact with the system via keyboard and mouse to fully identify problems.
2. Restart the K2 Solo 3G system.

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3. Once the startup sequence begins, observe the progression of behaviors as listed in the following table. These are the behaviors you should expect for a normally operating K2 Solo 3G system. If you observe behaviors other than those listed, refer to the indicated troubleshooting topics to identify problems.

   NOTE: You can press the Pause/Break key on the keyboard to keep startup text on the screen for longer viewing.

At about this time…	This behavior should occur…	If not, refer to the following:
—	Pressing the standby button starts the K2 Solo 3G system.	*Shutdown/restart problems* on page 74
0 seconds	Power on LED goes on and stays on.	*Power supply problems* on page 77
	Service LED stays off.	*Shutdown/restart problems* on page 74
	Front bezel assembly and processor fan start.	*Windows startup problems* on page 76
10 seconds	System BIOS screen appears.	*BIOS startup* on page 75
35 seconds	Grass Valley logo screen appears.	—
70 seconds	Windows logon screen appears.	*Windows startup* on page 75

Logon to Windows to continue the startup sequence.

After Windows logon:

At about this time…	This behavior should occur…	If not, refer to the following:
0 seconds	Grass Valley logo desktop appears.	*K2 Solo 3G system startup* on page 76
5 seconds	Service LED goes on for a few seconds, then off.	
20 seconds	Desktop icons, startbar, and AppCenter logon box appear.	*Windows startup* on page 75, *K2 Solo 3G system startup* on page 76

Logon to AppCenter to continue the startup sequence.

After AppCenter logon:

At about this time…	This behavior should occur…	If not, refer to the following:
0 seconds	System Startup messages appear.	*K2 Solo 3G system startup* on page 76

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At about this time…	This behavior should occur…	If not, refer to the following:
Time varies. Between 30 seconds and 2 minutes.	All system components check out as OK and AppCenter opens. Media operations are functional.	*Operational problems* on page 79

Shutdown/restart problems

If the K2 Solo 3G system is inoperable due to an error it can affect the operation of the standby button. If pressing the standby button does not shut down the K2 Solo 3G system, press and hold the button for five seconds. This forces the K2 Solo 3G system to execute a hard power down. If that doesn't work or if after the hard power down the system does not boot, disconnect then reconnect the power cable(s).

The K2 Solo 3G system is set to attempt to boot from a USB drive first, before it boots from the boot media card. If you have a drive connected to a USB port that does not contain an appropriate operating system and you start up the K2 Solo 3G system, an error message is displayed and the boot up process halts.

Checking external equipment

This section provides troubleshooting procedures for external devices that connect to the K2 Solo 3G system. Before using these procedures, first check connections.

Related Topics

Step 2: Check connections and external equipment on page 72

VGA display problems

Problem	Possible Causes	Corrective Actions
Screen turns on, but nothing from K2 Solo 3G system is displayed.	VGA connector or cable is not connected or is faulty.	Replace VGA monitor.
	K2 Solo 3G system system settings have been tampered with.	Restore default settings by restoring the system drive image from a recent backup image.

Keyboard and mouse problems

The keyboard and mouse are detected during BIOS startup. There should be a very brief message displayed indicating detection of input devices connected to USB ports

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Problem	Possible Causes	Corrective Actions
The K2 Solo 3G system does not respond correctly when one or more of the keys on the keyboard are pressed or the mouse is used.	The keyboard or mouse is faulty.	Replace the keyboard or mouse.
	K2 Solo 3G system system settings have been tampered with.	Restore default settings by restoring the system drive image from a recent backup image.

Power connection sequence

The following table lists the sequence of behaviors you should expect to see and/or hear as you connect the first power cable to a normally operating K2 Solo 3G system. If you observe behaviors other than those listed, refer to related topics in "K2 Summit Production Client Service Manual" to investigate potential problems.

In this time…	On the K2 Solo 3G system front panel or chassis, look/listen for the following…	If not, refer to the following.
0 seconds	Power supply fans go on and stay on.	*Power supply problems* on page 77
	Power on LED goes on and stays on.	
	Drive busy LED goes on then off.	*Media disk problems* on page 82

This power connection sequence assumes that before power was removed, the K2 Solo 3G system was properly shut down from AppCenter, from the Windows operating system, or from the standby button. If the power was removed without a proper shutdown, when the first power cord is connected the K2 Solo 3G system might go directly to the startup sequence.

Related Topics

Shutdown/restart problems on page 74

BIOS startup

A few seconds after startup, on the VGA monitor a screen displays BIOS information, with instructions about how to access settings. While this information is displayed, press the key on the keyboard as instructed to enter the BIOS settings pages. When the BIOS completes the Windows operating system begins to load.

If during the BIOS time a message appears that requires your input or if the K2 Solo 3G system does not progress to Windows startup, it indicates a problem at the motherboard level. To correct problems of this nature, contact Grass Valley Support.

Windows startup

After the host startup processes complete the Windows operating system starts up. Normally the Windows operating system completes its processes automatically without the need to press keys or respond to messages. When the Windows startup is complete the Windows logon dialog box is displayed.

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If the Windows startup screen does not proceed automatically or if a message appears that requires your input, it indicates a problem at the operating system level. If the problem cannot be corrected with a supported procedure (such as networking), the Windows operating system is not operating as it should. To correct problems of this nature, restore the system drive image.

Related Topics

Windows startup problems on page 76
Using recovery images on page 60

K2 Solo 3G system startup

After the Windows operating system startup processes complete, you must log in to AppCenter to trigger K2 Solo 3G system startup processes to begin. The K2 Solo 3G system determines that system health is adequate by checking critical subsystems. Critical subsystems are those upon which the K2 Solo 3G system depends for core media functionality. Critical subsystem checks are displayed in the System Startup message box.

When all critical subsystem checks are successful, AppCenter opens. If a critical error occurs, a message appears and AppCenter does not open. You can check the list of the messages that can appear.

To correct problems revealed at system startup, use the indicated troubleshooting information from the following sections.

Related Topics

Critical system startup messages on page 38

Windows startup problems

Problem	Possible Causes	Corrective Actions
A “Non-system disk. Press any key to restart” message appears.	A non-bootable USB drive is connected.	Remove the USB drive, then press any key to continue.
	The boot media is corrupted.	Restore from the USB Recovery Flash Drive.

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Thermal problems

Problem	Possible Causes	Corrective Actions
The K2 Solo 3G system overheats. This can be accompanied by a StatusPane message indicating a temperature or fan problem.	Airflow is blocked. The fan module is not operating correctly.	Ensure adequate airflow around the K2 Solo 3G system. Inspect the fans in the front bezel assembly and its connections for proper operation. If the fans are not operating correctly, replace the front bezel assembly.

Codec board problems

Investigate the problem further as described in the following table. If the problem persists, contact Grass Valley Support.

Problem	Possible Causes	Corrective Actions
A system status message indicates a problem with the codec board.	The codec module is not connected properly or is faulty.	Check the codec board indicator (LED) on the rear panel. Visually inspect codec module. Make sure it is connected properly and there is no sign of physical damage. Restart the K2 Solo 3G system. If the problem persists, replace the codec module.

Power supply problems

Problem	Possible Causes	Corrective Actions
The K2 Solo 3G system will not power on or power fails while the K2 Solo 3G system is in operation. This can be accompanied by a StatusPane message indicating a power supply problem prior to the failure.	The power source is faulty.	Make sure your power source is reliable.
	A power cord is faulty.	Both power supplies run and the K2 Solo 3G system can operate with just one power cord connected. Connect one power cord at a time and test with a replacement cord.
	The K2 Solo 3G system is too hot. The built-in overtemperature protection can shut down the power supply.	Check for thermal problems. Cool the K2 Solo 3G system.

USO RESTRITO

Problem	Possible Causes	Corrective Actions
	The power supply is faulty. This is indicated if the front panel power indicator does not come on.	Replace the power supply.
Power supply "~AC" LED is amber	Over temperature due to air flow restriction.	Check for and remove any air flow blockage around the power supply.
	Over temperature due to power supply fan failure.	Visually inspect fan. Listen for fan noise. If faulty, replace power supply.
	Over current, under voltage, over voltage. These conditions could be caused by a faulty FRU module.	Disengage all FRU modules, then re-engage one at time. If one module causes the amber LED to go on, replace the module. If both power supplies have the amber LED, disengage one, then the other. If doing so results in just one power supply having the amber LED, replace that power supply.

Related Topics

Power supply module removal

Video problems

For the corrective actions in this section, refer to related topics in "K2 AppCenter User Manual" for detailed instructions.

Problem	Possible Causes	Corrective Actions
The picture level modulates at a particular frequency.	There is distortion in the video input signal.	Check the video input signal for distortion. Compare with test color bars and audio test tone.
In stop mode the still-play video shows some motion jitter.	Two fields are displayed in still play mode.	Switch the still-play mode setting to Field.
The video displays erratically moving green lines.	K2 Solo 3G system is not locked to a video reference.	Lock the K2 Solo 3G system to a video reference.

Audio problems

For the corrective actions in this section, refer to related topics in "K2 AppCenter User Manual" for detailed instructions.

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Problem	Possible Causes	Corrective Actions
No record audio.	Wrong audio input selected.	Select the correct audio input.
No embedded audio.	Video source does not have embedded audio.	Check your video source for embedded audio.
Playback audio output is distorted.	Audio input signal clipping caused by excessive audio input level.	Check for input audio clipping. Adjust the audio input trim. Adjust the Player audio level. Reduce the source audio input level.
Audio level is too low.	Audio level needs to be adjusted.	Adjust the Player or Recorder audio level. Increase the source audio input level.
The audio level is not correct only when playing a particular clip.	The clip's audio level is out of adjustment.	Load the clip in Player and adjust its playback audio level.
Audio level meters do not display the correct reference level on connected equipment.	Incorrect audio reference level.	Select the correct audio reference level.
Audio meters do not appear in the AppCenter Monitor Pane.	The Monitor Pane configured to not display audio meters.	Configure the Channel Monitoring setting to display audio meters.

Timecode problems

For the corrective actions in this section, refer to related topics in "K2 AppCenter User Manual" for detailed instructions.

Problem	Possible Causes	Corrective Actions
Recorded timecode reads xx.xx.xx.xx.	During recording, the channel had no timecode source.	Check that you have the right record channel timecode source selected, verify that timecode is present in the source, and record the clip again. You can also stripe the timecode on an existing clip.
A clip shows no mark-in/mark-out timecode, the current timecode display shows XX:XX:XX:XX, or the last valid timecode is displayed.	The selected timecode source was missing or intermittent during recording.	

Operational problems

For the corrective actions in this section, refer to related topics in "K2 AppCenter User Manual" for detailed instructions.

USO RESTRITO

Problem	Possible Causes	Corrective Actions
Moving video in AppCenter does not operate.	The K2 Solo 3G system is not licensed for AppCenter Pro.	Obtain an AppCenter Pro license.
	The VGA monitor resolution is less than 1024x768x32.	Configure VGA monitor resolution. The resolution must be at least 1024x768x32 to support live video.
	Another user is connected via Remote Desktop.	Restart AppCenter.
After restarting, a file modification, configuration setting, or other change is lost.	The write filter is enabled.	Disable the write filter, make the change that you want to make permanent, then enable the write filter.
The K2 Solo 3G system is not operating as expected in relation to a setting displayed in Configuration Manager.	The setting was changed in Configuration Manager but not saved to the database.	Verify the setting you want in Configuration Manager and then select OK. When prompted to change the system settings, select Yes.
AppCenter displays different buttons than those expected.	Assignable buttons have been changed.	Assign buttons to the interface as desired.
A clip does not play, even though other clips play on the same channel.	The clip does not match current K2 Solo 3G system settings or the clip is corrupt.	If the clip appears grayed-out it means it doesn't match current settings. Check the clip's properties and verify they are correct for the standard, compression, and other current settings. Compare properties with those of a clip that plays correctly. If properties are correct the clip is corrupt. Delete and re-record the clip.
	The K2 system is not licensed for the format of the clip.	Verify licensing.
A clip can not be edited.	The clip is locked.	Unlock the clip.
Can't rename a clip or modify mark-in/mark-out points	The clip loaded or playing is still being recorded. In this case, "Read-Only" is displayed in the StatusBar.	Wait until recording is complete.
Cannot load and play a list.	The list contains invalid clips.	Check format, licensing, and security setting of the clips in the list.
On setting mark-out, the subclip is automatically generated and ejected, and a new subclip name is loaded in the subclip pane.	Auto Subclip mode is enabled.	Disable Auto Subclip mode.

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Problem	Possible Causes	Corrective Actions
Can't change what information is displayed in the Monitor Pane for Playlist.	You are attempting to use Configuration Manager to change what information is displayed in Monitor Pane for Playlist.	Use the Playlist Options dialog instead.
Can't control a channel from AppCenter. Controls are disabled.	The channel is configured for control by a remote control protocol.	Set the control mode for limited local control.

System problems

For the corrective actions in this section, refer to related topics in "K2 AppCenter User Manual" for detailed instructions.

Problem	Possible Causes	Corrective Actions
One of the record channels does not record or video is jumpy.	The K2 Solo 3G system is configured for PAL, yet the video input is NTSC	Check the current setting for video standard. Verify that the video input signal is the correct standard.
A scheduled event, such as an automatic play or record event, does not occur at the proper time.	The time-of-day source for event scheduling is not accurate.	Verify the time-of-day source. Verify the source's time accuracy.

Storage problems

Use the following sections if you suspect problems with your K2 Solo 3G system's storage. Refer to related topics in "K2 System Guide" for Storage Utility procedures.

Media File System problems

Problem	Possible Causes	Corrective Actions
One or more clips do not play or record correctly. This can be accompanied by a StatusPane message indicating a fault in the media file system.	The media database is out of sync with the media files or there is a corrupt media file. Also check the storage system for causes related to certain usage patterns.	1. If the problem is only associated with a specific clip or clips, delete the problem clips. If the problem persists, proceed with the next step. 2. Use Storage Utility and Check File System. If the file system fails the check process you must make a new file system. When you do so you lose all media.

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Problem	Possible Causes	Corrective Actions
During K2 Solo 3G system startup a "…no file system running…" message appears.	The file system is corrupt or disks are faulty/missing such that they are not part of a stripe group.	Use Storage Utility and Check File System. If the file system fails the check process you must make a new file system. When you do so you lose all media.

Related Topics

Checking the storage system on page 83

Media disk problems

On the Windows desktop open the "My Computer" for you K2 system and do a quick check of the drives. You should see C: and V: drives.

Problem	Possible Causes	Corrective Actions
No clips appear in the Clips pane. This may be accompanied by a startup message or a StatusPane message regarding media disks being unavailable.	A media disk is bad or there has been a hardware failure.	Open Storage Utility and identify faulty disks. Replace faulty disks.
The StatusPane message "Media disks getting full…" appears or a "FSS 'default(0)'" message appears.	The media disks are reaching maximum capacity.	In Recorder, select the Time Dome and choose **Available Storage**. If the Time Dome is filled it confirms that your K2 Solo 3G system is out of space. Make space on the media drives by doing the following: - Delete unused clips and empty the Recycled Bin.
When streaming to another K2 Solo 3G system the operation fails. In Transfer Monitor the streaming operation shows "Status:Error".	There is a network connection error or the media disks at the destination are reaching maximum capacity.	Check network connections and configuration. Check available storage on the destination K2 Solo 3G system. In Recorder, select the Time Dome and choose **Available Storage**. If the Time Dome is filled it confirms that the destination K2 Solo 3G system is out of space. Make space on the media drives by deleting unused clips and emptying the Recycle Bin.
System status message "File system…is fragmented".	Extended record/play activity has fragmented the disks.	Use the Storage Utility to check the file system.

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Checking the storage system

The following section provides guidelines for investigating problem areas related to the storage system. Use this section if you have problems with media input and/or output that are intermittent or seem to be related to certain usage patterns.

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Problem	Possible Causes	Corrective Actions
Symptoms can include black video recorded or at playout, frozen video, slow performance, or inconsistent media access. These symptoms can be accompanied by StatusPane messages regarding disk problems or overrun/underrun conditions for encoders, decoders, or timecode.	The following causes can occur on their own or in combination to produce the problem: • Disk oversubscription — This occurs when requests to the media disk exceed the disk's bandwidth capabilities. This generally occur in extreme cases when a combination of high-bandwidth operations are taking place, such as jog/shuttle, record/play on multiple channels, or streaming multiple clips. • High CPU activity in Windows — This occurs when activities on the Windows operating system over-tax the capabilities of the CPU. This commonly happens when unsupported software has been installed that competes with K2 Solo 3G system applications. Virus scanners and screen savers can cause this type of problem, since they can start automatically and consume system resources. • Encoder overrun — This occurs when an encoder is flooded with more data than it can process within its real-time requirements for recording. • Decoder underrun — This occurs when a decoder is starved for data and cannot deliver enough to satisfy real-time requirements for playout. • Disk faults — This occurs when a media disk is severely fragmented or has a bad blocks that interfere with some, but not all, media operations. For example, a particular clip can be written on a bad block, so the problem occurs only on that clip.	Try to re-create the problem. Identify all the interactions that affected the system and run all the same operations as when the error occurred. Record/play/stream the same clips. Investigate the functions that seem to push the system into the error state. If you determine that certain simultaneous operations cause the problem, re-order your workflow to avoid those situations. If you determine that the problem is only on certain clips, investigate disk faults.

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Network, transfer, and streaming problems

Remember to disable the write filter before making changes and enable the write filter after making changes.

Problem	Possible Causes	Corrective Actions
When importing or exporting (sending) between K2 Solo 3G systems a "…failed to connect…" message appears and the operation fails.	There is a problem with Windows networking or there is a mis-spelling with the host name as entered in Configuration Manager.	Check networking as follows: - Check basic Windows networking. Use Windows Explorer to test a basic copy operation to the machine to which you are trying to connect. If basic networking fails, use standard Windows procedures to troubleshoot and correct your network. - If the Windows network is working properly, in AppCenter select **System | Configuration | Remote** and verify that the name of the machine to which you are trying to connect is spelled correctly and has no extra spaces or characters.
	The K2 Solo 3G system to which you are trying to connect is not operating or the network is mis-configured.	Verify that the K2 Solo 3G system to which you are trying to connect is operational and that the network is configured correctly. Verify that the name of the K2 Solo 3G system is entered correctly in the Configuration Manager Hosts page. Refer to networking topics in "K2 System Guide".
A networked device does not appear in the "Import" and "Send to" dialog boxes, even though it is present on the Windows network.	The device is not entered as a host.	In AppCenter select **System | Configuration | Remote | Add** and enter the name of the machine to which you are trying to connect. Make sure it is spelled correctly and has no extra spaces or characters. Also check the hosts file. Refer to networking topics in "K2 System Guide".
	If a SAN K2 client, the client's K2 Media Server with role of FTP server is not operational.	Verify FTP server.
Files do not appear in" Send To" or "Export" dialogs.	File names do not have proper extensions.	Rename files with proper extensions.

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Also refer to the *UIM Instruction Manual* for more troubleshooting information.

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Chapter 5

Removing and replacing FRUs

This section contains the following topics:

- *Removing and replacing FRUs*
- *External Parts Removal*
- *Internal Parts Removal*

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Removing and replacing FRUs

Field Replaceable Units (FRUs) are modular hardware components that can be serviced without disturbing other components in the system.

The pictures in the following topics show how to disassemble. Unless otherwise documented, re-assembly is the reverse.

To complete all FRU procedures, the following tools are required:

- Torx tool with T15 magnetic tip. This is the only tool needed for most FRU procedures. If additional tools are required, they are listed with the FRU procedure.
- #1 Phillips screwdriver
- #2 Phillips screwdriver
- 3/16” nut driver
- 1/4” nut driver
- Side cutters

NOTE: Only Grass Valley components are supported. Do not attempt to use components procured from a different source.

NOTE: Do not discard any hardware unless specifically instructed to do so.

⚠ ***WARNING: To avoid serious injury from high currents, ensure that both power cords are disconnected prior to removing or replacing any parts.***

⚠ ***CAUTION: This system contains board-level components that must be protected from static discharge and physical shock. Wear a wrist strap grounded to the system chassis when handling system components.***

External Parts Removal

All the parts in this category can be removed and replaced without opening the K2 Solo 3G system cabinet.

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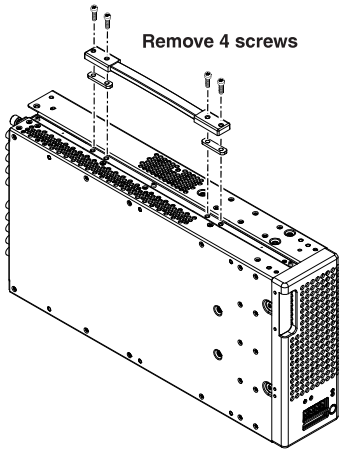
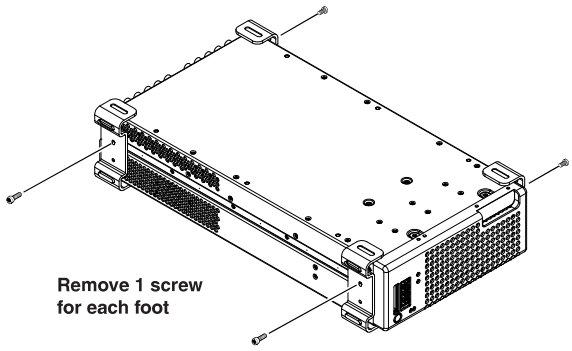
Handipak handle removal

Remove the optional Handipak handle as illustrated.



Handipak feet removal

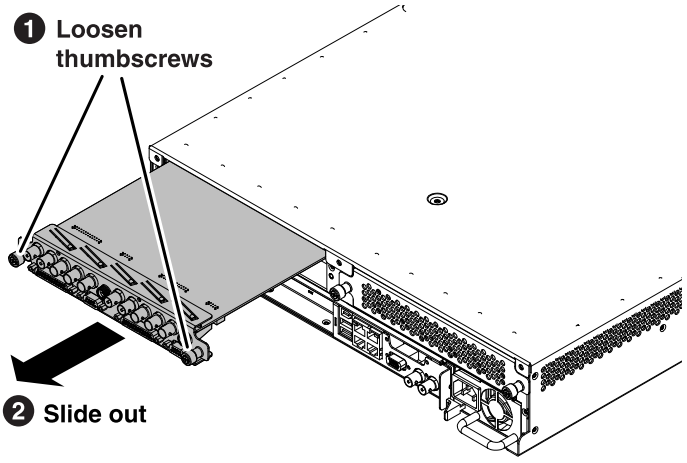
Remove one or more of the optional Handipak feet as illustrated.



USO RESTRITO

Codec module removal

Access the codec module from the rear panel. Remove as illustrated.



NOTE: With a firm grip on the metal (EMI) bracket, ensure the board is level and parallel to the card guides to avoid damage to the components on the edge opposite the rear panel.

⚠ ***CAUTION: Improper handling can damage components on the board. Do not allow the board to come in contact with the chassis sheet metal during removal or installation. The components on the edge opposite the rear panel are the most susceptible to damage.***

Before installing, inspect the codec module chamber and make sure no cables are protruding into the path of the codec module.

You must also remove any codec option (mezzanine) cards from the faulty codec module and install them on the replacement codec module.

After installing the replacement codec module, install the current version of K2 software. An over-install is all that is required. You do not need to first un-install the software. This ensures that the board is flashed with the proper version to be compatible with K2 software.

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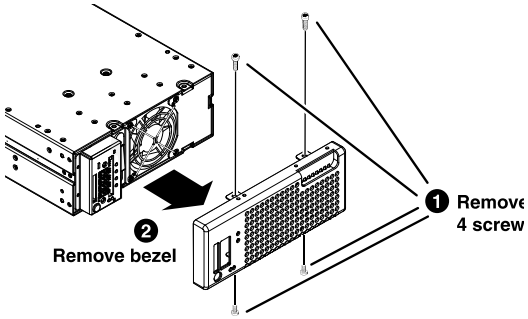
Front bezel removal K2 Solo

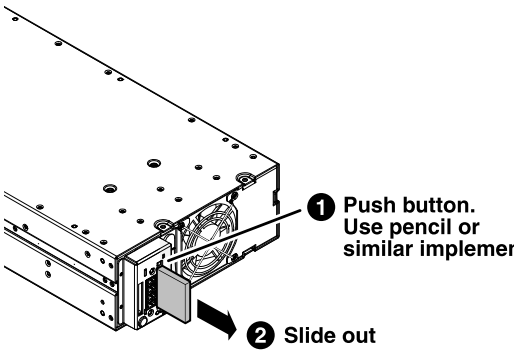
To remove the front bezel, proceed as illustrated.



⚠ ***CAUTION: Do not remove bezel while power is on. If powered, the fan can turn on with moving blades exposed.***

CompactFlash boot media removal K2 Solo

To remove the boot media, first remove the front bezel, then proceed as illustrated.



You must use the CompactFlash boot media provided by Grass Valley. Do not use CompactFlash media procured elsewhere.

Fan assembly removal

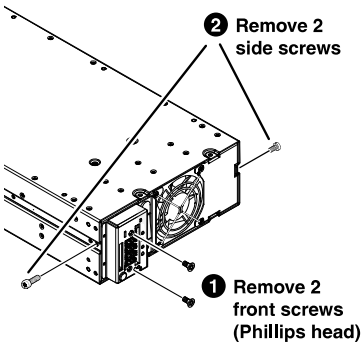
Additional tools needed:

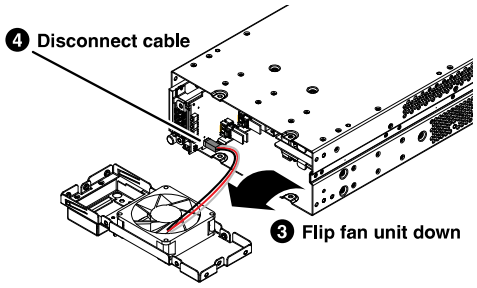
- #2 Phillips screwdriver

Before doing this task, do the following:

- Remove the front bezel.

To remove the fan assembly, proceed as illustrated.





⚠ ***CAUTION: Do not remove fan assembly while power is on. The standby button is frequently bumped during this procedure and if powered, circuits and fans are activated, which can cause damage.***

Fan removal

Additional tools needed:

- #2 Phillips screwdriver

Before doing this task, do the following:

- Remove the front bezel.

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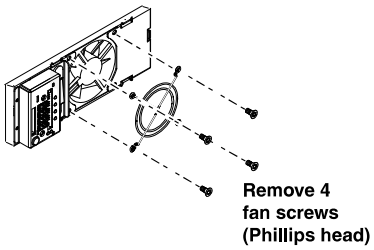
- Remove the fan assembly.

  To remove the fan, proceed as illustrated.

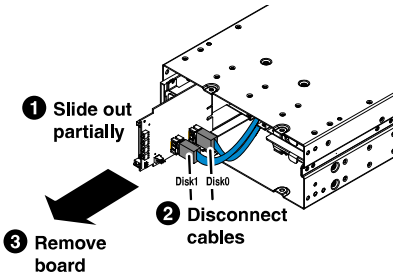


Disk controller board removal

Before doing this task, do the following:

- Remove the front bezel.
- Remove the fan assembly.

To remove the disk controller board, proceed as illustrated.



Note: Cables are labeled to identify Disk0 and Disk1 connections.

Related Topics

Restoring disk controller configuration on page 56

Front interconnect board removal

Before doing this task, do the following:

- Remove the front bezel.

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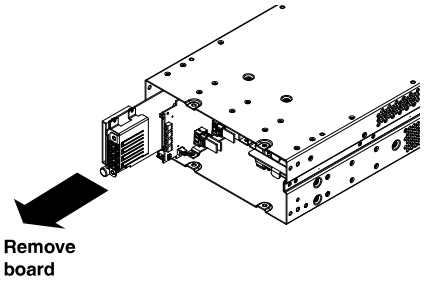
- Remove the fan assembly.

  To remove the front interconnect board, proceed as illustrated.

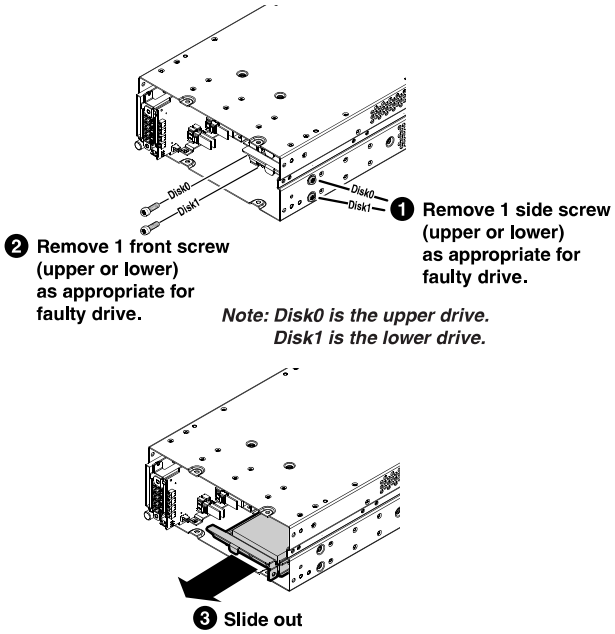


Disk module removal

Before doing this task, do the following:

- Make sure you have identified the proper disk module. In some cases you must also perform operations with Storage Utility.
- Remove the front bezel.
- Remove the fan assembly.

  To remove a disk module, proceed as illustrated.



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Internal Parts Removal

The sections that follow show how to remove internal parts from the K2 Solo 3G system.

⚠ ***CAUTION: To avoid possible damage to circuit boards and other sensitive parts, turn off the* K2 Solo 3G system *and disconnect both power cords before opening the top cover or removing any internal parts.***

Top cover removal

Before doing this task, do the following:

- Remove the front bezel.
- Remove the fan assembly.
- Remove the disk controller board.

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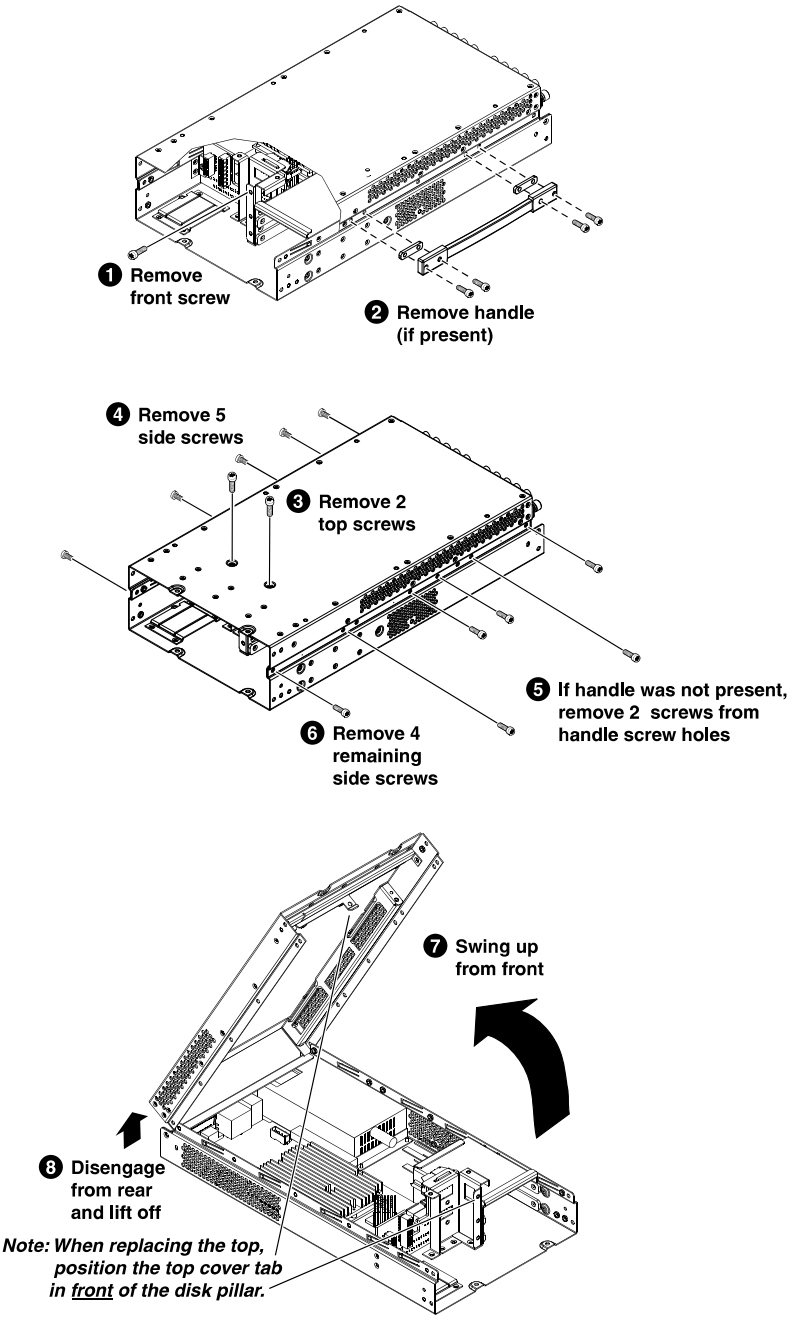
- Remove the front interconnect board.

  To remove the top cover, proceed as illustrated:


1 Remove front screw
2 Remove handle (if present)
4 Remove 5 side screws
3 Remove 2 top screws
5 If handle was not present, remove 2 screws from handle screw holes
6 Remove 4 remaining side screws
7 Swing up from front
8 Disengage from rear and lift off
Note: When replacing the top, position the top cover tab in front of the disk pillar.

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Unfasten and disconnect cables

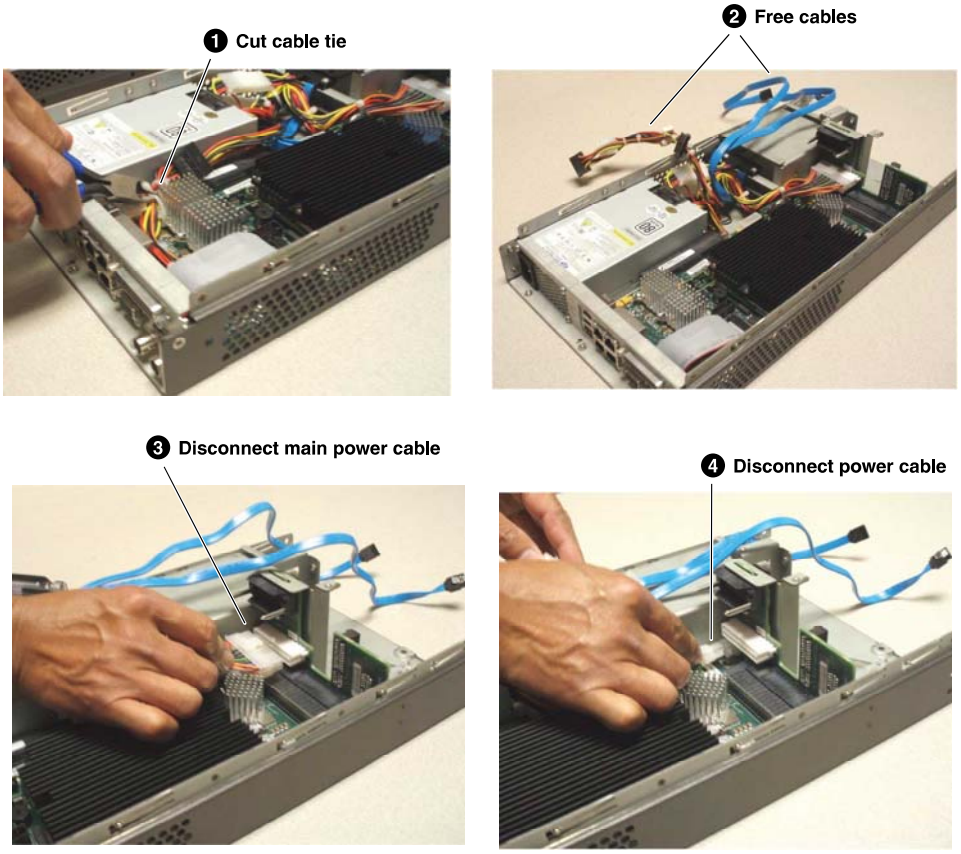
Additional tools needed:

- Side cutters

Before doing this task, do the following:

- Remove the top cover.

  To remove any of the internal FRUs you must cut cable ties, free cables, and disconnect cables as shown.



Related Topics

Installing components and dressing cables on page 102

Remove rear panel

Additional tools needed:

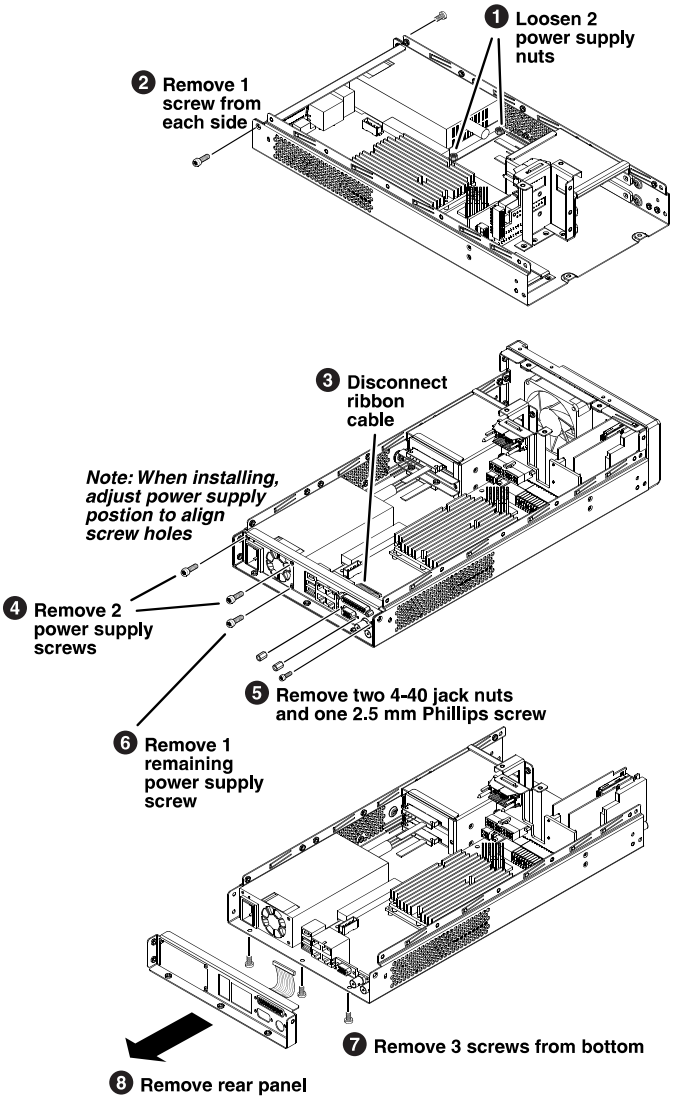
- #1 Phillips screwdriver
- #2 Phillips screwdriver
- 3/16” nutdriver

- 1/4” nutdriver

Before doing this task, do the following:

- Remove the top cover.
- Unfasten/disconnect cables.

Remove the rear panel as illustrated.


1 Loosen 2 power supply nuts
2 Remove 1 screw from each side
3 Disconnect ribbon cable
Note: When installing, adjust power supply postion to align screw holes
4 Remove 2 power supply screws
5 Remove two 4-40 jack nuts and one 2.5 mm Phillips screw
6 Remove 1 remaining power supply screw
7 Remove 3 screws from bottom
8 Remove rear panel

Related Topics

Installing components and dressing cables on page 102

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Carrier module removal

Before doing this task, do the following:

- Remove the top cover.
- Unfasten/disconnect cables.
- Remove the rear panel.

To remove the carrier module, proceed as illustrated.

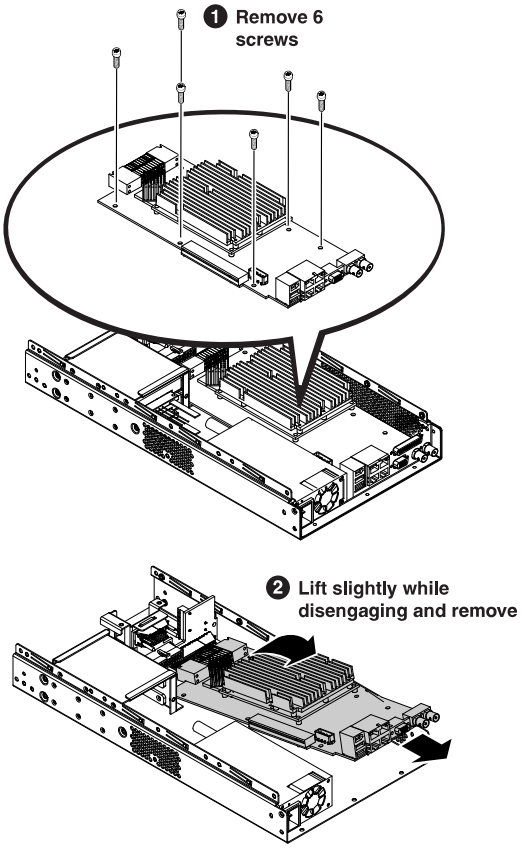
⚠ ***Caution: Improper handling can damage components on the board.***

Maintain clearance between board and standoffs on chassis bottom.

Do not allow the board to come in contact with the standoffs or chassis sheet metal during removal or installation.

Do not slide board.

The components on the bottom are the most susceptible to damage.



When replacing the carrier board, position the board so that it lines up with the screw holes beneath.

Related Topics

Installing components and dressing cables on page 102

Power supply removal

Additional tool needed:

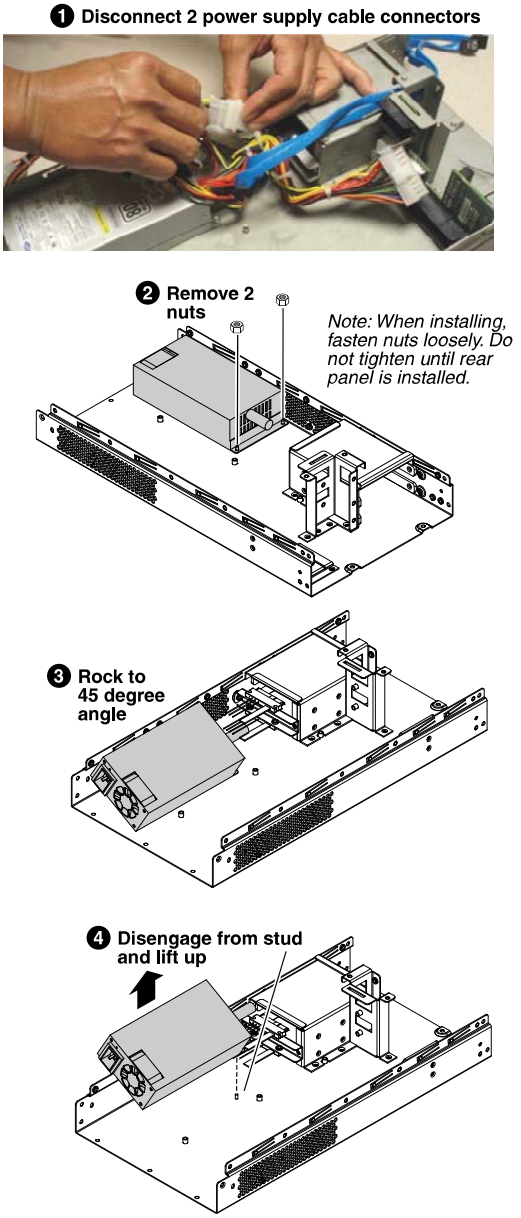
- 1/4” nutdriver

Before doing this task, do the following:

- Remove the top cover.

- Unfasten/disconnect cables.
- Remove the rear panel.
- Remove the carrier board.

To remove the power supply proceed as illustrated.


1 Disconnect 2 power supply cable connectors
2 Remove 2 nuts
Note: When installing, fasten nuts loosely. Do not tighten until rear panel is installed.
3 Rock to 45 degree angle
4 Disengage from stud and lift up

Related Topics

Installing components and dressing cables on page 102

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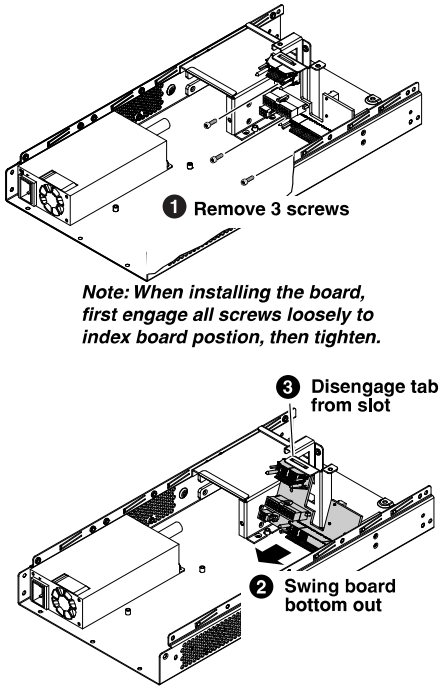
Midplane board removal

Before doing this task, do the following:

- Remove the top cover.
- Unfasten/disconnect cables.
- Remove the rear panel.
- Remove the carrier board.

To remove the midplane board proceed as illustrated.


1 Remove 3 screws
Note: When installing the board, first engage all screws loosely to index board postion, then tighten.
3 Disengage tab from slot
2 Swing board bottom out

Related Topics

Installing components and dressing cables on page 102

Drive cable assembly removal

Before doing this task, do the following:

- Remove the top cover.
- Unfasten/disconnect cables.
- Remove the rear panel.
- Remove the carrier board.

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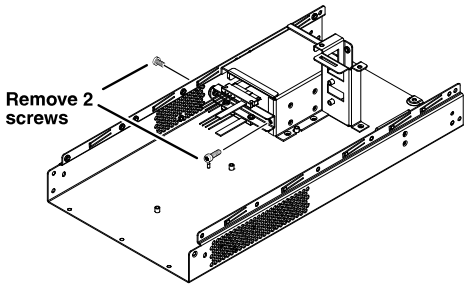
- Remove the power supply.

  To remove the drive cable assembly proceed as illustrated.



Related Topics

Installing components and dressing cables on page 102

Installing components and dressing cables

Materials needed:

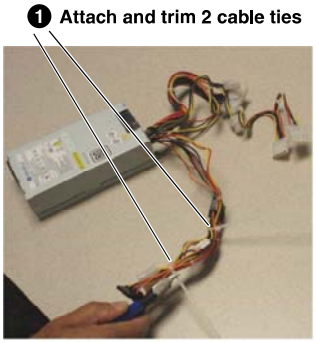
- Cable ties, as provided in FRU kit.

When installing internal components, follow the steps below, especially for cable routing and dressing.

NOTE: Take care with cable dressing, as cables must be trapped in the lower chassis to maintain clearance for codec module removal and installation. Incorrectly dressed cables can damage the codec module.

When following the steps below, also refer to removal procedures earlier in this section, with re-assembly being the reverse of the removal procedure.

1. If replacing a midplane board, install it in the chassis.
2. If replacing a power supply, pre-dress unused cables as illustrated:



NOTE: Use the faulty power supply that you removed as a model for cable dressing.

3. If replacing a power supply, install it in the chassis.

4. Install the carrier module.
5. Install the rear panel.

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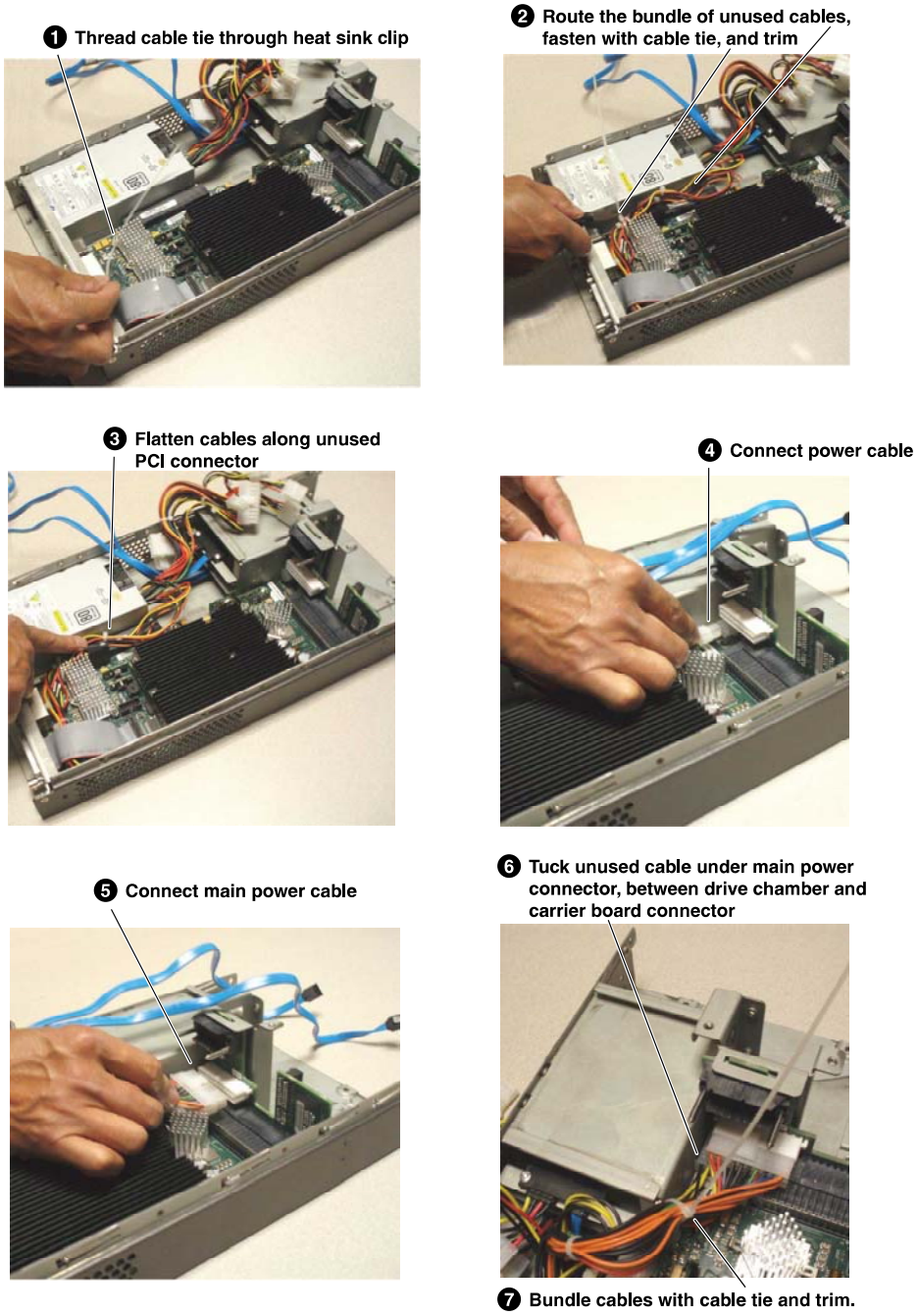
6. Dress and connect cables as illustrated.


1 Thread cable tie through heat sink clip
2 Route the bundle of unused cables, fasten with cable tie, and trim
3 Flatten cables along unused PCI connector
4 Connect power cable
5 Connect main power cable
6 Tuck unused cable under main power connector, between drive chamber and carrier board connector
7 Bundle cables with cable tie and trim.

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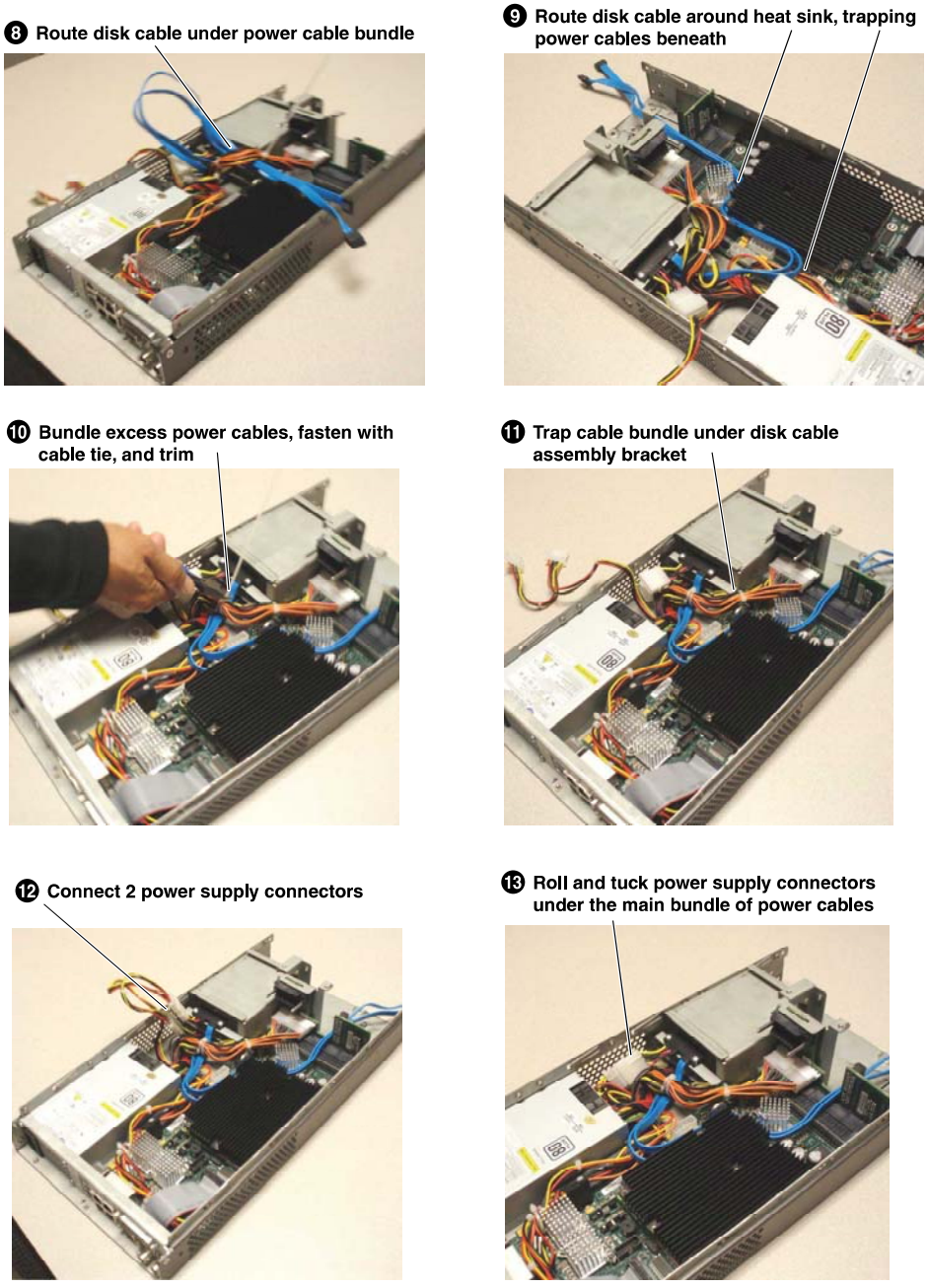
8 Route disk cable under power cable bundle
9 Route disk cable around heat sink, trapping power cables beneath
10 Bundle excess power cables, fasten with cable tie, and trim
11 Trap cable bundle under disk cable assembly bracket
12 Connect 2 power supply connectors
13 Roll and tuck power supply connectors under the main bundle of power cables

7. When cable dressing is complete, make sure that no cables protrude above the level of the drive chamber top.
8. Install the top cover.

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Appendix **A**

Trademarks and Agreements

This section contains the following topics:

- *Trademarks*
- *JPEG acknowledgment*

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Trademarks

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JPEG acknowledgment

This software is based in part on the work of the Independent JPEG Group.

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